89-718
No.

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In The
Supreme Court of the United States

OCTOBER TERM, 1989

MOR-FLO INDUSTRIES, INC. and
AMERICAN APPLIANCE MFG. CORP.,

Petitioners,

v.

STATE INDUSTRIES, INC.,

Respondent.

ON PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

PETITIONER'S APPENDIX

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STATE INDUSTRIES, INC.,
Plaintiff/Cross-Appellant,

v.

MOR-FLO INDUSTRIES, INC. and
AMERICAN APPLIANCE MFG. CORP.,
Defendants-Appellants.

Nos. 89-1032, 89-1033

United States Court of Appeals,
Federal Circuit

Decided: August 31, 1989

Before MARKEY, Chief Judge. MAYER and MICHEL, Circuit Judges.

MAYER, Circuit Judge.

OPINION

Mor-Flo Industries, Inc. and its subsidiary, American Appliance Manufacturing Corporation (Mor-Flo), infringed State Industries, Inc's. (State) Patent No. 4,447,377, covering a method of insulating water heaters with foam. State Indus. v. Mor-Flo Indus., 639 F. Supp. 937, 231 USPQ 241 (E.D. Tenn. 1986), *aff'd*, 818 F.2d 875 (Fed. Cir. 1987). After the damages trial, the district court awarded State lost profits on approximately 40% of Mor-Flo's infringing sales and a royalty of 3% on the remaining 60%. It concluded that Mor-Flo's infringement was not willful and denied enhanced damages and attorney's fees. 8 USPQ2d 1971 (E.D.

Tenn. 1988). We affirm the judgment insofar as it awards lost profits and a 3% royalty, but vacate and remand for a redetermination of the judgment that the infringement was not willful.

Background

The '377 patent claims a method of insulating the tank of a water heater by using polyurethane foam. The method includes wrapping the tank with a plastic sheet shaped as an envelope, installing a surrounding jacket and cover, pouring foam through an opening in the cover into the envelope, and then plugging the opening. The method contains the liquid foam while it rises and prevents it from invading areas, such as the electrical components and combustion chamber, which must be kept free of foam. State also has another patent, U.S. Patent No. 4,527,543, not contested here, that claims water heaters using the '377 envelope construction.

Mor-Flo's method found to be infringing used a cylindrical piece of plastic that was pulled over the top of the tank with fiberglass positioned around the combustion chamber at the bottom of the tank. The "sleeve" was taped below the top of the fiberglass. A jacket was then installed over the tank and sleeve, a top was installed, and foam was shot into the sleeve through an opening in the top. 639 F. Supp. at 947, 231 USPQ at 248.

In the liability trial, Mor-Flo maintained that the sleeve was not an "envelope" or "'wrapped' around the

tank" as required by the '377 patent. The sleeve, however, was identical to an embodiment shown in the patent (partial envelope), and was merely secured differently at the bottom of the tank. The illustrated embodiment also revealed a pull-over structure similar to Mor-Flo's sleeve. The district court found that it was especially damaging to Mor-Flo that it did not conceive of its "strikingly similar" sleeve method until after purchasing and disassembling a State foam-insulated water heater. Therefore, the court held that Mor-Flo's method literally infringed the '377. The district court alternatively held that it infringed the patent under the doctrine of equivalents. *Id.* at 950, 231 USPQ at 251.

The water heater industry is intensely competitive and marked by small profit margins. The invention is pertinent to all water heaters, but the infringement at issue here is restricted to residential gas water heaters, in particular those deemed "energy efficient" by the American Society of Heating, Refrigeration and Air Conditioning Engineers. Foam provides greater insulating capacity than the other alternative, fiberglass; therefore, foam-insulated heaters have cost advantages in terms of material, packaging and freight. The greater insulating capacity enables foam-insulated heaters to meet the energy code requirements imposed by many states by using less space than fiberglass-insulated heaters. The density of foam also strengthens the outer jacket of the water heater and makes it more resistant to denting.

In deciding the damages question, the district court faced three issues: lost profits, reasonable royalty and willful infringement. Infringement occurred between

May 8, 1984, when the patent issued, and June 9, 1986, when Mor-Flo switched to the noninfringing method of fiberglass foam stops, which eliminates need for the envelope taught by the patent in suit yet keeps foam from invading the combustion chamber. State produced evidence of lost sales, and took the position that it should recover lost profits for its market share of Mor-Flo's infringing sales and a reasonable royalty for the remainder. It also asked increased damages for willful infringement and attorney fees.

The district court agreed with State in the award of lost profits for part of its damages and a royalty for the rest. The court found there was a growing demand for foam-insulated water heaters, the '377 patent was the first method developed to meet this demand, and there were no other methods available during the pertinent period that were either noninfringing or acceptable as substitutes. Specifically, the court found "that, during the period of infringement, all but one of State's competitors in the United States sold foam insulated water heaters made using State's patented method, or one of a strikingly similar configuration, and/or Denton Patent No. 4,527,543 - namely Mor-Flo/American; Hoyt Heater Company; Rheem Manufacturing Company; and Bradford-White. A Canadian competitor, G.S.W. Inc. of Toronto also sold foam insulated water heaters using one of the above-mentioned methods of foaming." 8 USPQ2d at 1974.

A. O. Smith Corporation, the only clearly noninfringing competitor used the less preferable fiberglass insulation. Hoyt also sold only fiberglass-insulated heaters until 1985 when it added a foam-insulated heat-

er to its inventory. The court found that fiberglass was not an acceptable substitute for foam because of foam's advantages in reducing the size of water heaters, increasing resistance to denting, and meeting governmental energy standards.

The court also found that State was capable of producing during the relevant period, and had sales and distribution capacity to ship and sell, sufficient foam-insulated water heaters to exploit its market share of Mor-Flo's sales. Finding that State has approximately 40% of the gas water heater market nationwide, the court awarded State the profits it lost on 40% of the sales of 754,181 infringing Mor-Flo water heaters.

For the remaining 60% of Mor-Flo's sales, State asked for a royalty of 8 to 10%. Mor-Flo presented no evidence of what it would have paid for a license, but argued that in no event should the royalty rate be above its net profit margin which, for the seventeen months preceding the date infringement began, was 2.1%. The district court awarded a royalty of 3% on the remaining 60% of infringing sales. Finally, the court concluded the infringement was not willful because Mor-Flo relied in good faith on advice of outside counsel that its process was not infringing.

Mor-Flo appeals both the award of actual damages and the reasonableness of the royalty. State cross-appeals the reasonableness of the royalty and the court's failure to hold Mor-Flo's infringement willful and to award increased damages and attorney's fees.

Discussion

Deciding how much to award as damages is not an exact science, and the methodology of assessing and computing damages is committed to the sound discretion of the district court. King Instrument Corp. v. Otari Corp., 767 F.2d 853, 863, 226 USPQ 402, 409 (Fed. Cir. 1985). A challenger must show that "the district court abused its discretion by basing its award on clearly erroneous factual findings, legal error, or a manifest error of judgment." DataScope Corp. v. SMEC, Inc., ___ F.2d ___, ___, 11 USPQ2d 1321, 1323 (Fed. Cir. 1989) (quoting Nickson Indus. v. Rol Mfg. Co., 847 F.2d 795, 798, 6 USPQ2d 1878, 1879 (Fed. Cir. 1988)).

The measure of damages is an amount which will compensate the patent owner for the pecuniary loss sustained because of the infringement. 35 U.S.C. § 284 (1982); *see also* General Motors Corp. v. Devex Corp., 461 U.S. 648, 654-55, 217 USPQ 1185, 1188 (1983); Del Mar Avionics, Inc. v. Quinton Instrument Co., 836 F.2d 1320, 1326, 5 USPQ2d 1255, 1260 (Fed. Cir. 1987). But the floor for a damage award is no less than a reasonable royalty, Seattle Box Co. v. Industrial Crating & Packing Inc., 756 F.2d 1574, 1581, 225 USPQ 357, 363 (Fed. Cir. 1985), and the award may be split between lost profits as actual damages to the extent they are proven and a reasonable royalty for the remainder. *See* TWM Mfg. Co. v. Dura Corp., 789 F.2d 895, 898, 229 USPQ 525, 526 (Fed. Cir. 1986).

A.

To get lost profits as actual damages, the patent owner must demonstrate that there was a reasonable probability that, but for the infringement, it would have made the infringer's sales. Water Technologies Corp. v. Calco Ltd., 850 F.2d 660, 671, 7 USPQ2d 1097, 1106 (Fed. Cir. 1988); Del Mar, 836 F.2d at 1326, 5 USPQ2d at 1260; *see also* Bio-Rad Laboratories v. Nicolet Instrument Corp., 739 F.2d 604, 616, 222 USPQ 654, 664 (Fed. Cir. 1984) (amount of lost profits may not be speculative). But "[t]he patent holder does not need to negate all possibilities that a purchaser might have bought a different product or might have foregone the purchase altogether." Paper Converting Mach. Co. v. Magna-Graphics Corn., 745 F.2d 11, 21, 223 USPQ 591, 598 (Fed. Cir. 1984).

A standard way of proving lost profits, first announced in Panduit Corp. v. Stahlin Bros. Fibre Works, 575 F.2d 1152, 1156, 197 USPQ 726, 730 (6th Cir. 1978), is for the patent owner to prove: "(1) demand for the patented product, (2) absence of acceptable noninfringing substitutes, (3) his manufacturing and marketing capability to exploit the demand, and (4) the amount of the profit he would have made." The district court relied heavily on this test and we have accepted it as a nonexclusive standard for determining lost profits. Carella v. Starlight Archery & Pro Line Co., 804 F.2d 135, 141, 231 USPQ 644, 648 (Fed. Cir.), *on rehearing*, 1 USPQ2d 1209 (Fed. Cir 1986); Bio-Rad, 739 F.2d at 616, 222 USPQ at 663; *cf.* Ryco, Inc. v. Ag-Bag Corp., 857 F.2d 1418, 1427, 8 USPQ2d

1323, 1330 (Fed. Cir. 1988) (referring to Panduit as one of the tests). With only slight modification we think it fits here and confirms the district court's judgment.

Absence of Substitutes and Market Share

This is the first time we have considered whether lost profits can be based on market share. Other courts of appeals that have faced the question have found it unnecessary to answer it. *See* Baumstimler v. Rankin, 677 F.2d 1061, 1072, 215 USPQ 575, 584 (5th Cir. 1982); Hughes Tool Co. v. G. W. Murphy Indus., 491 F.2d 923, 929, 180 USPQ 353, 358 (5th Cir. 1973).

We start with the presumption that the judgment of the district court is correct, of course, and that the only limit on its discretion in selecting a remedy is that it be adequate to compensate for the damages suffered as a result of the infringement. *See* Seattle Box, 756 F.2d at 1581, 225 USPQ at 363. Any doubt about the correctness of the award is resolved against the infringer. *See* Gyromat Corp. v. Champion Spark Plug Co., 735 F.2d 549, 554, 222 USPQ 4, 8 (Fed. Cir. 1984); Lam, Inc. v. Johns-Manville Corp., 718 F.2d 1056, 1065, 219 USPQ 670, 675 (Fed. Cir. 1983).

Frequently, the patent owner and infringer are the only suppliers in the market, and the owner is seeking to recover profits lost through every sale made by the infringer. *See* Water Technologies, 850 F.2d at 672, 7 USPQ2d at 1106; Amstar Corp. v. Envirotech Corp., 823 F.2d 1538, 1543, 3 USPQ2d 1412, 1415 (Fed. Cir.

1987); Lam, Inc., 718 F.2d at 1065, 219 USPQ at 675. In the two-supplier market, it is reasonable to assume, provided the patent owner has the manufacturing and marketing capabilities, that it would have made the infringer's sales. *See* Del Mar, 836 F.2d at 1327, 5 USPQ2d at 1260. In these instances, the Panduit test is usually straightforward and dispositive. *Cf.* Water Technologies, 850 F.2d at 671-72, 7 USPQ2d at 1106 ("[w]here a patent owner maintains that it lost sales equal in quantity to the infringing sales, our precedent has approved generally the [Panduit test]. . . .").

Here we have multiple competitors and the patent owner contends that all the competitors infringed or sold a far less preferable alternative -- fiberglass. The district court made the absence of acceptable substitutes, Panduit item (2), a neutral factor by crediting all the other competitors with their market shares as State requested. If the court is correct in its finding that the other competitors were likely infringers of one or the other of State's patents, State would have been entitled to their shares of the market on top of its own, and a correspondingly greater share of Mor-Flo's sales. If it is wrong in whole or in part, State would have been entitled to its current share or to a lesser increase in share. We need not decide which it is because it would make no difference to the outcome. State would get at least what it asked for, because as discussed further below the district court found, and we agree, that State's share of the market was proven.

But Mor-Flo should not complain because if anything it received a windfall from this approach. To the

extent infringing competitors got credit for sales that should have gone to State, the share of the market against which Mor-Flo's damages might be assessed is reduced. So we think that in these circumstances the presence or absence of acceptable noninfringing alternatives does not matter. The question then becomes whether an established market share combined with the other Panduit factors is sufficient to show State's loss to a reasonable probability. Bio-Rad, 739 F.2d at 616, 222 USPQ at 663.

Demand

At the infringement phase of this case, the district court said, "Both sides admit that there was a great need to develop foam insulated heaters in the late 1970's. The patented method solved the[] problems [of foam leakage and invasion], and was apparently the first to do so in the water heater industry." 639 F. Supp. at 945, 231 USPQ at 247. In a 1979 internal memo, Mor-Flo's own vice president of engineering stated: "With reference to heaters with foam insulation, it was felt that the word foam has a magic sound to it at this time, and even if a fiberglass were available that would be equal to foam, a foam insulated heater would be required."

After the introduction of foam insulation, State's annual sales jumped from less than two hundred thousand to more than four hundred thousand heaters between 1984 and 1986, and accounted for 1,275,525 sales for a net revenue of $155.2 million. Sales of foam heaters by Mor-Flo amounting to more than $83.9 mil-

lion in total revenue are further evidence of demand. Gyromat, 735 F.2d at 552, 222 USPQ at 6. Mor-Flo used the foam insulation feature to "sell up" its entire line of heaters in its trade brochures. Three of the other four competitors used foam insulation. At the damages trial, Mor-Flo presented no evidence on what, if any, unique value any other components of its water heater added.

In describing the demand for State's method, the district court said, "Although there was no demand by customers or consumers of residential gas water heaters that heaters be foamed in accordance with any particular method, during the period of infringement of State's patent, there was no acceptable non-infringing method of satisfactorily foaming gas water heaters in the market place." 8 USPQ2d at 1973. In effect then, the demand went to the method.

Mor-Flo counters that there were other methods available -- the Rheem patented plastic foam belt, the "top-off" method, and the fiberglass foam stop -- and the district court erred in finding that all of these methods probably infringed State's patents, and, in any event, were not available as of the date of infringement. But it did not prove that either the "top-off" method or fiberglass foam stops were available during the period of infringement. Bradford-White's president testified that Bradford-White started using the "top-off" method in 1984 or 1985, but he prefaced this with the statement: "I'm not positive." There is no other evidence that anyone used the "top-off" method until Hoyt switched to it in 1987. Mor-Flo similarly attempts to

rely on testimony of Bradford-White's president that Bradford-White used a foam stop before switching to the "top-off" method. But again there is no credible evidence that the fiberglass foam stop was ever on the market until Mor-Flo introduced it in June of 1986. *See* Central Soya Co. v. Geo. A. Hormel & Co., 723 F.2d 1573, 1579, 220 USPQ 490, 494 (Fed. Cir. 1983) (to be a substitute for a method, the method must be on the market). Indeed, Mor-Flo filed a patent application on the foam stop in December 1986.

The district court may have erred in finding that the Rheem foam belt method likely infringed because the patent on the foam belt was issued before and was cited as prior art in the '377 patent. But we need not decide. Foam insulation was the source of customer demand and the only two available ways to do it, State's and Rheem's, were patented. It therefore is probable, in light of the district court's undisputed finding that customers did not care about the particular method used, that both State and Rheem would have sold their market shares of Mor-Flo's infringing sales. All of this leads to but one conclusion: There was a demand for State's method.

Manufacturing and Marketing

The finding that State has a 40% national market share is unassailable, and Mor-Flo does not seriously contend otherwise, or that State did not have the capacity to produce enough heaters to satisfy at least 40% of Mor-Flo's sales. It says rather that the majority of the infringing sales occurred in California where State

shared with Rheem and A. 0. Smith 10% of the market, while Mor-Flo had 70% and Hoyt had 20%. From this Mor-Flo argues that it is unrealistic to think State could achieve 40% of the West Coast market, especially where Hoyt, which manufactured noninfringing fiberglass-insulated heaters along with foam-insulated heaters, was Mor-Flo's next largest competitor.

State tells us there is no evidence to support this "Western Region" theory and our search of the record shows it was at best an incidental argument. Nevertheless, the district court made findings that State had the capacity to absorb its share of the market and we are shown no reason why they are wrong. From the evidence, there was demand for heaters made by the patented method, and State and Mor-Flo were head-to-head competitors. State was a nationally recognized leader in the industry, and it produced specific evidence that it had lost sales to Mor-Flo's infringing heaters on both coasts. For example, a retailer of State's heaters in California testified that he lost sales to a developer for 3,000 heaters annually to Mor-Flo. Another retailer testified that he lost sales to Mor-Flo in Connecticut. There is nothing speculative about these losses. After finding that State had sufficient marketing and manufacturing capabilities to meet its market share of the demand it is eminently reasonable for the district court to infer that State could have sold its market share of Mor-Flo's infringing sales wherever the opportunity occurred. We accordingly agree with the court that it is probable, at least, that State could have met the demand.

Amount of Profit

The district court awarded State its incremental profit on foam-insulated gas water heaters reflecting the percentage of sales revenue State lost because of Mor-Flo's infringement that would have been its profit. This approach is well established and appropriate for determining damages for patent infringement. *See* Paper Converting, 745 F.2d at 22, 223 USPQ at 599. There is some testimony that fixed costs might have varied slightly, but the district court did not abuse its discretion in concluding that any increase in fixed costs was minimal and that award of incremental profits was appropriate. No greater precision is required.

The court based the award on the profit margin of the heater as a unit in accord with the entire market value rule, which permits recovery of damages based on the value of the entire apparatus containing several features, where the patent related feature is the basis for customer demand. *See* TWM, 789 F.2d at 901, 229 USPQ at 528. In the face of the district court's finding to the contrary, Mor-Flo now argues that foam insulation was not the basis for consumer demand and several unidentified nonpatented components were key. But it did not identify or present evidence of the value of these nonpatented components. In any event, no components can be used separately, except as spare and repair parts for which State does not claim damages. *See* Kori Corp. v. Wilco Marsh Buggies & Draglines, Inc., 761 F.2d, 649, 656, 225 USPQ 985, 989 (Fed. Cir. 1985) (the entire market rule is properly applied when the nonpatented devices cannot be sold

without the patented feature). There is no merit to this argument and we leave undisturbed the district court's adoption of the entire market rule.

In our view, the foregoing discussion compels the conclusion that the district court acted well within its discretion when it awarded damages for Mor-Flo's infringing activity based on State's share of the market. The court had the obligation to decide the case, and to decide it on the evidence and theories the parties proposed. Mor-Flo's attempt to perfect the trial on appeal by referring to "evidence" and argument it might have presented to the trial court comes too late and we have, of course, ignored it. The case it might have made is irrelevant; on the record actually made, there was sufficient evidence for the court to find facts and draw inferences that support its damage award.

B.

The only direct evidence on what a reasonable royalty would have been is testimony of State's president that he would have asked for 8 to 10% of Mor-Flo's infringing sales, and its expert's declaration that a reasonable royalty would have been 8% of net infringing sales. Mor-Flo's actual net profit margin was 2.1% for the seventeen months preceding issuance of the patent, and Mor-Flo argues that it should pay a royalty no higher than that. Indeed, it says the rate should be minimal -- before the district court it urged an effective rate of .163%.

The determination of a reasonable royalty, however, is based not on the infringer's profit margin, but on what a willing licensor and licensee would bargain for at hypothetical negotiations on the date infringement started. Radio Steel & Mfg. Co. v. MTD Prod., Inc., 788 F.2d 1554, 1557, 229 USPQ 431, 433 (Fed. Cir. 1986). There is no rule that a royalty be no higher than the infringer's net profit margin. *Id.* State's was a proven process upon which Mor-Flo had already built an established, successful line of heaters, and which it had expanded upon since its introduction in 1981. The value of foam to Mor-Flo was obvious: it never considered fiberglass as an alternative and risked infringement with foam insulation. *See* TWM, 789 F.2d at 902, 229 USPQ at 529.

The value of collateral sales could also be factored into the royalty rate. Deere & Co. v. International Harvester Co., 710 F.2d 1551, 1559, 218 USPQ 481, 487 (Fed. Cir. 1983). Foam insulation was used to promote Mor-Flo's entire line of heaters. And it was not inappropriate for the district court to consider gross profits. Fromson v. Western Litho Plate & Supply Co., 853 F.2d 1568, 1578, 7 USPQ2d 1606, 1616 (Fed. Cir. 1988). Mor-Flo's gross profit during the preceding seventeen months was 19.6% with a net incremental profit of 17.48%. Finally, during the period of infringement, Mor-Flo's net profits varied from 5.9% to 7.3%. In light of all this, it seems to us the district court could very well conclude that a royalty of 3% of Mor-Flo's net sales is reasonable.

Mor-Flo repeats the argument that there were other methods available -- the Rheem patented plastic foam belt, the "top-off" method, and the fiberglass foam stop. As discussed earlier, State has not shown that the "top-off" method or fiberglass foam stop were available during the period of infringement. The district court may have overlooked that the Rheem patented plastic foam belt might have provided an alternative way to foam insulate heaters, but Mor-Flo presented no evidence that it could have licensed the Rheem foam belt, and at what cost. Again, the district court could only decide the case on the evidence before it, and we see no objection to its decision not to allow Mor-Flo to rely on the availability of third party patents to mitigate damages.

Turning to State's cross-appeal, the district court found that the water heater industry was intensely competitive with small profit margins and fiberglass was a lesser alternative that manufacturers, however reluctantly, would opt for if the licensing fee for foam was too high. State argues that fiberglass was simply not an alternative, but it is undisputed that fiberglass-insulated heaters were and are sold in direct competition with foam-insulated ones. So, notwithstanding State's asserted hope to license the method in the 8 to 10% range, it was well within the district court's province to conclude it would not have succeeded, that potential licensees would have stayed with lesser alternatives promising some profit, rather than risk losing money by signing on at that high a rate. The award of a 3% royalty may be too low for State and too high for Mor-Flo, but the district court did not abuse its discretion in

reaching it. DataScope, __ F.2d at __. 11 USPQ2d at 1326.

C.

Willful infringement is a question of fact reviewed under the clearly erroneous standard. *See* Studiengesellschaft Kohle m.b.H. v. Dart Indus., 862 F.2d 1564, 1573, 9 USPQ2d 1273, 1282 (Fed. Cir. 1988). To establish willful infringement, a plaintiff must prove by clear and convincing evidence that the defendant acted with no reasonable basis for believing it had the right to do so. E. I. DuPont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1440, 7 USPQ2d 1129, 1137 (Fed. Cir. 1988). There are no "hard and fast per se rules," and the finding is based on the totality of the circumstances. Rolls-Royce Ltd. v. GTE Valeron Corp., 800 F.2d 1101, 1110, 231 USPQ 185, 191 (Fed. Cir. 1986).

In its finding of nonwillfulness, the district court stated:

> Under the totality of the circumstances in this case, Mor-Flo/American should have known that their method of foaming gas residential water heaters infringed State's patent. Nevertheless, the Court finds that the evidence is insufficient to establish clearly and convincingly that Mor-Flo/American actually knew that their method infringed State's patent. Apparently, Mor-Flo/American did rely on advice of counsel. The advice was erroneous, but there is no evidence that Mor-Flo/American knew that the advice was erroneous. Thus, Mor-Flo/Ameri-

> can's infringement was not willful and the Court will not award punitive damages in this case. [8 USPQ2d at 1978.]

The standard for proving willfulness, however, is "whether, under all the circumstances, a reasonable person would prudently conduct himself with any confidence that a court might hold the patent invalid or not infringed." Ryco. 857 F.2d at 1428, 8 USPQ2d at 1331. Actual knowledge is not required. Therefore, the court's finding that Mor-Flo should have known of the infringement is inconsistent with its finding of nonwillfulness. But the district court also found that Mor-Flo relied in good faith on the erroneous advice of counsel that their method was not infringing. *See* Studiengesellschaft Kohle, 862 F.2d at 1578, 9 USPQ2d at 1286. On the other hand, it said that Mor-Flo "purposely patterned its foaming method upon State's," 8 USPQ2d at 1982; copying is evidence of willful infringement. Kaufman Co. v. Lantech. Inc., 807 F.2d 970, 978, 1 USPQ2d 1202, 1208 (Fed. Cir. 1986).

In view of the unresolved conflicting evidence, we vacate the judgment insofar as it denies increased damages under 35 U.S.C. § 284, and remand to the district court to reconsider whether a finding of willful infringement and enhanced damages is justified. Paper Converting, 745 F.2d at 20, 223 USPQ at 597. Because this could also affect its conclusion on attorney's fees, we do not reach them.

Conclusion

Accordingly, the judgment is affirmed in part, vacated in part, and remanded.

COSTS

Mor-Flo will bear the costs of this appeal.

AFFIRMED IN PART, VACATED IN PART AND REMANDED.

STATE INDUSTRIES, INC.,
Plaintiff/Cross-Appellant,

v.

MOR-FLO INDUSTRIES, INC. and
AMERICAN APPLIANCE MFG. CORP.,
Defendants-Appellants.

No. 89-1032

United States Court of Appeals,
Federal Circuit

Filed September 28, 1989

ORDER

Before MARKEY, Chief Judge, MAYER, Circuit Judge, and MICHEL, Circuit Judge.

A petition for rehearing having been filed in this case,

UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for rehearing be, and the same hereby is, denied.

The suggestion for rehearing in banc is under consideration.

The mandate will issue on October 5, 1989.

FOR THE COURT,

/s/

Francis X. Gindhart
Clerk

Dated: September 28, 1989

cc: CHARLES W. BRADLEY
PAUL R. PUERNER

STATE INC. V. MOR-FLO INC, 89-1032

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT
717 MADISON PLACE
WASHINGTON, D.C. 20439

October 11, 1989

Paul R. Puerner, Esq.
Fuller, Puerner & Hohenfeldt
633 W. Wisconsin Ave.
Milwaukee, WI 53203

Re: State Ind v. Mor-Flo Ind, No. 89-1032

Dear Mr. Puerner:

The court has requested a response from cross-appellant to appellants' Suggestion for Rehearing In Banc.

Please file your response in accordance with Federal Circuit Rule 35 on or before October 23, 1989.

Very truly yours,

/s/

Francis X. Gindhart

fxg:ld

cc: Charles W. Bradley

STATE INDUSTRIES, INC.,
Plaintiff-Cross Appellant,

v.

MOR-FLO INDUSTRIES, INC. and
AMERICAN APPLIANCE MFG. CORP.,
Defendants-Appellants.

No. 89-1032
No. 89-1033

United States Court of Appeals,
Federal Circuit

Filed October 25, 1989

ORDER

Upon consideration of defendants-appellants' motion to stay issuance of the mandate in this case for thirty (30) days pending the filing of a petition for certiorari, it is

ORDERED tht appellants' motion to stay issuance of the mandate for thirty (30) days is granted.

FOR THE COURT

/s/_____

Dated: 10/25/89
Washington, D.C.

cc: Charles W. Bradley, Esq.
Paul R. Puerner, Esq.

STATE INDUSTRIES, INC.,
Plaintiff,

v.

MOR-FLO INDUSTRIES, INC.,
Defendant.

STATE INDUSTRIES, INC.,
Plaintiff,

v.

AMERICAN APPLIANCE MFG. CORP.,
Defendant.

Nos. 2-84-276, 2-85-26

United States District Court,
Eastern District of Tennessee
Northeastern Division

July 21, 1988

Before HULL, Judge.

MEMORANDUM AND OPINION

This is a patent infringement action which revolves around a process used in insulating a water heater with foam. In a decision filed May 29, 1986 [Court Doc. 74], the Court found that the plaintiff State Industries, Inc.'s (State) Patent No. 4,447,377 (which details a method of insulating the exterior of a water heater tank with foam) was valid and had been infringed by the defendants Mor-Flo Industries, Inc. (Mor-Flo) and its wholly owned subsidiary American Appliance Manufac-

turing Corporation (American). The Court's liability decision was affirmed by the United States Court of Appeals for the Federal Circuit on March 3, 1987, and defendants' petition for rehearing was subsequently denied. Defendant's petition for a writ of certiorari to the United States Supreme Court was denied on October 5, 1987.

This matter came before the Court for trial without a jury for a determination of damages on May 2-3, 1988. After careful consideration of the sufficiency and weight of the evidence before the Court, the demeanor of the witnesses who testified at trial, the exhibits and depositions submitted by the parties, and the post-trial findings and briefs submitted by counsel, the Court makes the following findings of fact and conclusions of law as required by Rule 52 (a), Federal Rules of Civil Procedure.

FINDINGS OF FACT

1. This is an accounting for damages due to the infringement by Mor-Flo and American of Denton U.S. Patent No. 4,447,377, which is assigned to State.

2. The period of infringement was from May 8, 1984, when the patent issued, to June 9, 1986, when, shortly after this Court issued its order determining that the patent was valid and infringed, the defendants switched to a non-infringing method of foaming its gas water heaters.

3. In the late 1970's, there was a growing demand for energy saving water heaters. There was also a

great need to develop foam insulated water heaters. A given thickness of foam provides greater insulating capacity than fiberglass; thus, foam insulated water heaters offer cost savings in terms of material, packaging and freight. Moreover, the greater insulating capacity of foam means that foam insulated water heaters can meet the increased energy code requirements imposed by various states using less space than fiberglass insulated water heaters. In addition, the density of the foam insulation lends strength to the outer jacket of a water heater making a foam insulated water heater more resistant to denting than a fiberglass insulated water heater.

4. The pressure of competition and the growing demand for energy saving water heaters made Mor-Flo/American decide to make and sell a line of foam insulated residential gas water heaters. The importance attached by the defendants' upper management to the need to develop and market a full line of foam insulated water heaters is reflected in their own documents. In May of 1979, Walter Abt, Mor-Flo's President, stated in a letter to James Bridegum, then a Vice President of Manufacturing for American [Plts's Ex. 8]:

> We stressed the need for developing a full line of foam water heaters in order to cut down on the tremendous freight costs of shipping energy saver with fiberglass insulation. There is a paramount and definite need for acceleration of this program.

In July of 1979, Mr. Abt wrote to Jack Moore, then Chief Engineer of American, and Bob Montgomery,

then Vice President of Manufacturing for Mor-Flo, in regard to development of a manufacturing process for foam insulated water heaters [Pltf's Ex. 9], stating:

> From what I am hearing in the field, our competitors are ahead of us in the manufacture of heaters with foam.
>
> I expect to receive from you on Monday of each week our program of developing a final manufacturing process to produce water heaters with foam.
>
> See to it that I get it once a week until the project is completed and operating.

5. Mor-Flo/American had a problem successfully developing a foam insulated water heater. More specifically, Mor-Flo/American, in seeking to develop a viable foam insulated water heater, had problems containing the foam within the jacket of the heater; this prompted the purchase and tear down of an electric foam insulated State water heater in early 1980, revealing the foam-containing plastic bag. Mor-Flo/American then came up with its own variation of State's idea, one which had a strikingly similar foam containing configuration. Mor-Flo/American was unable to successfully foam a gas water heater without a bag.

6. The patented method solved the problems of foam leakage and invasion of areas such as the com-

bustion chamber of a gas water heater, and was the first to do so. The patented method fulfilled a long-felt need in the water heater industry.

7. In late 1981, Mor-Flo/American introduced its first line of energy saving gas residential water heaters employing a plastic sleeve to contain the foam. The line was expanded in subsequent years.

Underlying the introduction and expansion of Mor-Flo/American's line of foam insulated gas residential water heaters was customer concern about rapidly increasing utility costs as well as the changes in governmental energy requirements.

The importance of these market forces was recognized at the highest level of Mor-Flo's management and was emphasized by the president of Mor-Flo in his messages to the shareholders found at the beginning of Mor-Flo's Annual Reports during the years 1981-1984.

8. It was by replacing conventional fiberglass insulated water heaters with foam insulated water heaters that Mor-Flo/American met these demands in the market place. Mor-Flo/American introduced its line of foam insulated gas residential water heaters to improve the energy efficiency of conventional fiberglass insulated energy saving gas water heaters previously sold by Mor-Flo/American. The fiberglass insulated energy savers were in fact replaced by the foam insulated energy savers. The replacement of conventional fiberglass insulated water heaters by energy efficient

foam insulated water heaters was a significant change in Mor-Flo/American's product line.

9. There is no evidence that, in meeting the governmental energy requirements and growing customer demand, Mor-Flo/American ever considered fiberglass to be an acceptable substitute for foam. To the contrary, the evidence indicates that fiberglass over foam was unacceptable. In a memo written in November of 1979 [Pltf. Ex. 10], Edward Taylor, Vice President of Engineering for Mor-Flo, expressed the consensus of a group meeting of Mor-Flo upper management, writing:

> With reference to heaters with foam insulation, it was felt that the word foam has a magic sound to it at this time, and even if a fiberglass were available that would be equal to foam, a foam heater would be required.

10. The foam insulated gas residential water heaters introduced by Mor-Flo/American complimented and enhanced their overall product line. In the very competitive water heater industry, Mor-Flo/American's foam insulated gas residential water heaters were an important part of a full line of water heater products which allowed Mor-Flo/American to be more competitive in the market. Having a full line of water heater products allowed Mor-Flo/American to "sell up" (the capability of selling more energy efficient - and more expensive - gas water heaters to customers) and thereby maximize profits on water heater sales. Thus, foam insulated gas residential water heaters constituted an

important product line for Mor-Flo/American. The line of foam insulated gas residential water heaters was introduced by Mor-Flo/American with a relatively low capital expense and without increasing salaried administrative and supervisory personnel.

11. When the Denton patent-in-suit issued in May of 1984, Mor-Flo/American's foam insulated gas residential water heaters were a fully developed, proven, commercially acceptable, and profitable product line. State, like Mor-Flo/American, had enjoyed success and profit in the exploitation of the now patented method. State had directed that, effective May 8, 1984, its foam insulated product be marked with a label bearing the Patent number. State filed this lawsuit charging infringement of the patented method of foaming water heaters in July of 1984. Mor-Flo/American switched to a non-infringing new method of foaming its gas residential water heaters in June of 1986. Mor-Flo/American's present method of foaming its gas water heaters was a new method first developed in late 1985 and implemented in June of 1986, shortly after this Court held that Mor-Flo/American was in violation of State's patent rights.

12. As evidenced by the yearly statistical releases published by the Gas Appliance Manufacturers Association (GAMA), the overall market demand for energy saver-type residential gas heaters meeting the ASHRAE energy saving code requirements (which had been adopted by a large majority of states by May of 1984) steadily increased throughout the period of infringement.

13. During the period of infringement, there was a demand for foam insulated gas residential water heaters. The demand for foam insulated water heaters that caused Mor-Flo/American to adopt State's method persisted throughout the period of infringement. Although there was no demand by customers or consumers of residential gas water heaters that the heaters be foamed in accordance with any particular method, during the period of infringement of State's patent, there was no acceptable non-infringing method of satisfactorily foaming gas water heaters in the market place. The method of applying foam to insulate residential gas water heaters by using a foam stop (the method now employed by Mor-Flo/American) was not available during the time of infringement and had not been successfully used in the market place. Likewise, foaming without injecting through the cover (the method now used by two of the parties' competitors to foam their residential gas water heaters) was not developed and available the time of the infringement. Even though fiberglass insulation was available, the evidence in the record indicates that foam offered a variety of benefits over fiberglass in regard to insulating energy efficient gas residential water heaters. As previously mentioned, foam insulated gas residential water heaters offered the advantages of smaller sizes and resistance to denting as well as a savings in terms of materials and shipping. Thus, although clearly available, fiberglass was not an acceptable substitute for foam at the time of the infringement.

14. The evidence in the record shows that State, during the period of infringement, had the manufacturing and marketing capacity to exploit the demand for

foam insulated gas water heaters. State had the excess capacity at its Ashland City facility to make 35,898 additional foam insulated gas water heaters per month during 1984; 33,336 additional foam insulated gas water heaters per month in 1985; and 30,157 additional foam insulated water heaters per month in 1986. Also, during the 1984 to 1986 period, State had sufficient sales and distribution capacity to ship and sell an extra 12,000 to 15,000 water heaters per month.

15. During the period of infringement, Mor-Flo/-American admits that it sold 754,181 water heaters made using the patented method and realized net revenues of $83.9 million dollars from these sales. A more detailed summary of the sales is as follows:

5/84 - 12/84	1/85-12/85	1/86-6/86	5/84-6/86
UNITS SOLD			
214,951	362,474	176,756	754,181
NET SALES ($)			
$24,501,977	$40,542,366	$18,842,960	$83,887,303

16. Also evidencing the strong demand for water heaters made by the patented method are State's sales during the period of infringement. During the period of infringement, State sold 1,275,525 gas residential water heaters using the patented method and realized net sales of $155.2 million from these sales.

17. In 1984 and throughout the period of infringement, Mor-Flo/American and State were direct com-

petitors throughout the market place on a nationwide basis in the water heater industry.

18. The testimony of Phil Loughrey (State's Vice President of Marketing), Alec Dalziel (a wholesale plumbing distributor), and Calvin Hills (a wholesale plumbing distributor) at trial indicated that in the years 1984 to 1986, State lost sales to Mor-Flo/American due to Mor-Flo/American's infringement.

19. State is not taking the position that it would have made all of the sales that Mor-Flo/American made during the infringement period. The testimony of Mr. Loughrey was that State would have obtained only its then existing market share of Mor-Flo/American's directly competing sales of foam insulated water heaters made using the patented method. Based upon State's financial records of its sales of foam insulated gas water heaters and the GAMA Statistical Reports of overall industry sales of ASHRAE-type gas water heaters, State has shown that its share of the market for energy efficient gas residential water heaters was 37.28% in 1984; 40.22% in 1985; and 38.29% in 1986. Based upon these market shares, State lost the following sales due to Mor-Flo/American's infringement:

	Mor-Flo Net Sales	State Market Share	State Lost Sales
1984	$24,501,977	37.28%	$9,134,337
1985	$40,542,366	40.22%	$16,306,139
1986	$18,842,960	38.29%	$7,214,969

20. Also based upon these market shares, in terms of units, State lost sales amounting to 10,017 foam insulated gas water heaters per month in 1984; 12,149 foam insulated gas water heaters per month in 1985; and 11,280 foam insulated gas water heaters per month in 1986. As previously stated, based upon State's production records for the years 1984 to 1986, State had the excess production capacity to produce these additional water heaters and had sufficient sales and distribution capacity to ship and sell the additional water heaters.

21. The record before the Court in this case shows that, during the period of infringement, all but one of State's competitors in the United States sold foam insulated water heaters made using State's patented method, or one of a strikingly similar configuration, and/or Denton Patent No. 4,527,543 -- namely Mor-Flo/American; Hoyt Heater Company; Rheem Manufacturing Company; and Bradford-White. A Canadian competitor, G.S.W. Inc. of Toronto also sold foam insulated water heaters using one of the above-mentioned methods of foaming. Lawsuits brought by State charging infringement of the patent-in-suit and the Denton '543 Patent are currently pending in federal district courts against Hoyt Heater Co. and Rheem Manufacturing. State has authorized its attorneys to commence a similar suit against G.S.W. Inc. in Canada and is considering suit against Bradford-White pending resolution of the case now before the Court.

The sole competitor to avoid any possible infringement was A. O. Smith who did so by selling

fiberglass insulated gas water heaters. In 1984 Hoyt Heater Co. also sold a line of fiberglass insulated gas water heaters, but switched to foam insulated water heaters by April of 1985.

However, the mere existence of fiberglass insulated water heaters in the market place during the period of infringement does not by itself make these water heaters acceptable substitutes. The evidence before the Court demonstrates that foam was clearly the preferred method of insulating gas residential water heaters. If there had been acceptable substitutes in May of 1984, and if there was no market demand, then Mor-Flo/American along with the other named manufacturers would not have run the risk of infringement.

22. Using State's position on lost profits, full credit is given to all sales by its competitors of energy saving gas water heaters since State is only seeking its 40% market share of Mor-Flo/American's sales.

23. State's chief cost accountant, Bob Holland testified as to the incremental profit State obtained by its sale of foam insulated gas residential water heaters during the period of infringement. From information derived from State's audited financial records, State has shown that its incremental profit derived from the sale of foam insulated residential water heaters during the period 5/84 to 12/84 was $7,006,421 upon net sales of $44,469,500, or 15.76%. During the period 1/85 to 12/85, State's incremental profits were $12,089,140 upon net sales of $74,867,357, or 16.15%. During the period 1/86 to 6/86, State's incremental profits were $6,281,482

upon net sales of $35,866,939, or 17.51%. These incremental profit percentages reflect that portion of sales revenues that State lost due to Mor-Flo/American's infringement that would have constituted State's profits. Both Mr. Holland and Herbert Lindahl, President of State Industries, Inc.' testified that State relies upon incremental profit information in its normal business practices.

24. State's damages based upon its lost profits attributable to State's market share of Mor-Flo/American's infringing sales are calculated as follows:

	State Lost Sales	State Incremental Profit %	State Lost Profit
1984	$9,134,337	15.76%	$1,439,572
1985	$16,306,139	16.15%	$2,633,441
1986	$7,214,969	17.51%	$1,263,293*
Total			$5,336,306

25. With respect to the remainder of Mor-Flo/-American's sales during the period of infringement, State seeks damages in the form of a reasonable royalty. For the purpose of this accounting, the focus date, when the hypothetical license negotiations to determine the reasonable royalty are deemed to have taken place, is May of 1984.

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* Relying on the plaintiff's calculations, the Court notes a $48.00 error.

26. In May of 1984, State was selling foam insulated gas residential water heaters in direct competition with Mor-Flo/American throughout the market place in the water heater industry; and Mor-Flo/American's line of foam insulated gas residential water heaters was already an established and profitable product line.

27. State's president, Mr. Lindahl, testified at trial that, had Mor-Flo/American accepted State's offer to negotiate for a license in the spring of 1984 (an offer actually made by State that Mor-Flo/American rejected), he would have asked for a royalty of 8% to 10% of the sale of Mor-Flo/American products made using the patented method.

Edwin Luedeka, State's expert on the issue of reasonable royalty, also testified that in his opinion a reasonable royalty in this case would be 8% of the Mor-Flo/American's net infringing sales.

28. State's financial expert Charles Behrens testified that he conducted a study of Mor-Flo/American's financial records, for the seventeen-month period preceding May of 1984, in order to determine what the value of the sale of foam insulated gas residential water heaters was to Mor-Flo/American during this period. Mr. Behrens testified that using the total company profit and loss approach, Mor-Flo/American's net profit as a percentage of net trade sales for foamed gas residential water was 2.1%; this testimony was unrebutted at trial.

It was Mr. Behrens' opinion, however, that the value of the product line to Mor-Flo/American would be more accurately reflected by using a contribution margin or incremental profit approach. This approach would demonstrate what contribution was made to the overall profits of Mor-Flo/American as a result of the sale of the product made using the infringing method by isolating the items of revenues and expense that change as a result of the presence or absence of the foam insulated gas residential product line (those revenues and costs being called "variable"). Those revenues and costs which would not change with the presence or absence of the product line (those being called "fixed") are not considered, because they would continue whether or not the product line was present. It was Mr. Behrens' opinion, based upon his study, that during the period January of 1983 to May of 1984, the presence of the foam insulated gas residential product line made a contribution to Mor-Flo/American's overall profits in the amount of 16.58% of the net sales of that product.

29. Mor-Flo American's financial expert, Donald L. Madden, testified that (based upon his review of the formal financial statements of State and Mor-Flo/American for the period of 1981 through 1986, certain depositions and exhibits, a visit to one of Mor-Flo/American's plants, and Mr. Behrens' report and testimony) he did not agree with Mr. Behrens' contribution margin approach for several reasons. First, in Mr. Madden's opinion, the contribution margin measure is a short-term decision tool whereas the decisions in question are of a long term nature; therefore, the con-

tribution margin approach is not an appropriate approach to use in this case. Second, Mr. Madden questioned the verifiability of the data used by Mr. Behrens since no where in the formal financial record of State and Mor-Flo/American or the exhibits submitted at trial did it appear that either State or Mor-Flo/American used analyses on a regular basis that would test the variability of cost. Finally, since there was no indication of any testing of the measures involved, Mr. Madden questioned the assumptions made by Mr. Behrens with respect to the method used to determine which costs were fixed and with respect to his assumption that there would be no change in fixed costs.

Mr. Madden reviewed the production data units produced at Mor-Flo/American's Johnson City, Tennessee, plant for the period 1983 to 1984, looking specifically at each of the manufacturing expense accounts that were reflected in their trial balance. Based upon his review of this data and the changes in the corresponding manufacturing overhead expense accounts, it was Mr. Madden's opinion that out of eighteen accounts which Mr. Behrens had assumed were fixed or variable, only three of these accounts satisfied the definition of fixed costs, and none satisfied the definition of variable costs. Mr. Madden did not extend the study to determine all of the cost factors associated with the manufacturing process.

Mr. Madden testified that, in his opinion, assuming that there were no alternative methods to replace the infringing method, management would look to the profit before taxes measure for the product line

in question when preparing for a hypothetical license negotiation. Mr. Madden did not prepare his own study, however.

30. The differential cost approach proposed by Mor-Flo/American for determining a reasonable royalty assumes that there were acceptable non-infringing substitutes available in May of 1984. The evidence presented at trial, however, was that there were no non-infringing acceptable substitutes available at that time.

31. There are several third-party patents setting forth various methods of foam insulating water heaters, two of which are assigned to Rheem Manufacturing Company, one which is assigned to G.S.W., Inc., and one which is assigned to Bradford-White. State claims that each of the patents infringes either the patent-in-suit or its Denton U.S. Patent No. 4,527,543. Regardless of any infringement, each of the other patents issued after May of 1984 and are third party patents. Therefore, none of these represents alternatives that were known, available, and acceptable to Mor-Flo/-American in May of 1984.

32. In May of 1984, in view of the traditionally small profit percentages and intense competition in the water heater industry, the parties would have recognized that the defendants would be at a serious competitive disadvantage price-wise with respect to their five other competitors, four of whom were selling foam insulated gas residential water heaters at that time; and that, thus, if Mor-Flo/American were to pay more than

a minimum royalty, they would be unable to pay the royalty and still make a reasonable profit. This would operate to reduce the reasonable royalty.

33. Although fiberglass was not an acceptable non-infringing substitute for foam due to the advantages offered by foam, which have previously been detailed herein, fiberglass was available and was being used in May of 1984 (A.O. Smith sold only fiberglass insulated water heaters and not foam). Reasonably prudent businessmen in 1984 would have recognized that in a competitive industry with traditionally small profit percentages, a manufacturer such as Mor-Flo/American would choose to market a less desirable product and still make a reasonable profit, rather than market a more desirable product and make less than a reasonable profit. This would operate to reduce the reasonable royalty.

34. Using the hypothetical negotiation approach to determine a reasonable royalty under the circumstance presented in this case, the Court finds that a reasonable royalty would be 3% of Mor-Flo/American's remaining net sales (that portion of Mor-Flo/American's sales for which State does not seek lost profits). The remaining portion of Mor-Flo/American's sales that are subject to the 3% reasonable royalty are calculated as follows:

	Mor-Flo Net Sales	State Lost Sales	Sales Subject To 3% Royalty
1984	$24,501,977	$ 9,134,337	$15,367,640
1985	$40,542,366	$16,306,139	$24,236,227
1986	$18,842,960	$ 7,214,969	$11,627,991
Totals	$83,887,303	$32,655,445	$51,231,858

35. State's damages based upon a 3% reasonable royalty applied to the remaining portion of Mor-Flo/American's sales are calculated as follows:

1984	$15,367,640	X 3%	=	$461,029
1985	$24,236,227	X 3%	=	$727,087
1986	$11,627,991	X 3%	=	$348,840
Total				$1,536,956

36. The reasonable royalty of 3% is sufficient to adequately compensate State for Mor-Flo/American's infringement. Therefore, there is no need to increase the royalty as requested by State.

37. State's total damages, taking into account its lost profits and its entitlement to a reasonable royalty, are $6,873,262.

38. State is entitled to a recovery of prejudgment interest. There is no evidence to justify withholding such an award.

39. Under the evidence presented in this case, State is entitled to prejudgment interest based upon the pre-

vailing prime rates during the period of infringement. Using these prime rates, prejudgment interest is computed on a quarterly basis. For each quarterly period, the interest is calculated using the unpaid balance present at the beginning of the quarterly period and the prime rate in existence at the end of the quarterly period. The interest is compounded by adding the interest so calculated to the unpaid balance for the next quarterly calculation. The calculation is summarized as follows:

Period	Prime Rate	Lost Profits	Reasonable Royalty	Calculated Interest	Unpaid Balance
5-4-84 - 6-30-84	13.00%	359,892	115,257	0	475,149
6-30-84 - 9-30-84	12.75	539,840	172,886	15,270	1,203,145
9-30-84 - 12-31-84	10.75	539,840	172,886	32,600	1,948,471
12-31-84 - 3-31-85	10.50	658,360	181,772	50,447	2,839,050
3-31-85 - 6-30-85	9.50	658,360	181,772	67,243	3,746,425
6-30-85 - 9-30-85	9.50	658,360	181,772	89,709	4,676,266

Period	Prime Rate	Lost Profits	Reasonable Royalty	Calculated Interest	Unpaid Balance
9-30-85 - 12-31-85	9.50	658,361	181,771	111,974	5,628,372
12-31-85 - 3-31-86	9.00	757,976	209,304	124,904	6,720,556
3-31-86 - 6-30-86	8.50	505,317	139,536	142,421	7,507,830
6-30-86 - 9-30-86	7.50	0	0	141,929	7,649,759
9-30-86 - 12-31-86	7.50	0	0	144,612	7,794,371
12-31-86 - 3-31-87	7.50	0	0	144,142	7,938,513
3-31-87 - 6-30-87	8.25	0	0	163,283	8,101,796
6-30-87 - 9-30-87	8.75	0	0	178,683	8,280,479
9-30-87 - 12-31-87	8.75	0	0	182,624	8,463,103
12-31-87 - 5-13-88	8.50	0	0	264,095	8,727,198
5-13-88 - 6-30-88	8.50	0	0	42,680	8,769,878
		5,336,306	1,536,956	1,896,616	

40. Prejudgment interest calculated in the above manner, through June of 1988, totals $1,896,616.

41. Under the totality of the circumstances in this case, Mor-Flo/American should have known that their method of foaming gas residential water heaters infringed State's patent. Nevertheless, the Court finds that the evidence is insufficient to establish clearly and convincingly that Mor-Flo/American actually knew that their method infringed State's patent. Apparently, Mor-Flo/American did rely on advice of counsel. The advice was erroneous, but there is no evidence that Mor-Flo/American knew that the advice was erroneous. Thus, Mor-Flo/American's infringement was not willful and the Court will not award punitive damages in this case.

42. There are no exceptional circumstances in this case to justify an award of attorney's fees. The evidence provided to the Court by State to support its allegations of an attempt by Mor-Flo/American to bypass discovery channels during the accounting stage of this proceedings was not sufficient evidence to support a finding of the exceptional circumstances necessary to justify an award of attorney's fees in this case.

43. Based on the evidence submitted at trial, the Court finds that State did not intentionally conceal evidence from the Court during the liability stage of this case by failing to disclose, in response to certain broadly-cast interrogatories, a suggestion made in July of 1977 by Mr. Connie Pardue, as assembly line worker for State. State satisfactorially explained its failure to

disclose the existence of the information during the liability phase of this case.

CONCLUSIONS OF LAW

1. The applicable statutory authority for determining damages in this patent infringement case is 35 U.S.C. § 284, which provides:

> Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court.
>
> When the damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed.
>
> The court may receive expert testimony as an aid to the determination of damages or of what royalty would be reasonable under the circumstances.

2. In determining the amount of a damage award to compensate a patent holder for infringement, the Court may consider the profits the patent holder lost as a result of the infringement. Paper Converting Machine Co. v. Magna-Graphics, 745 F.2d 11, 21 (Fed. Cir. 1984). The award of lost profits is proper when it is demonstrated to a reasonable probability that a sale would have been made by the patent holder but for the

infringement. Del Mar Avionics, Inc. v. Quinton Instrument Co., 836 F.2d 1320, 1326 (Fed. Cir. 1987).

3. To the extent that the patent holder cannot establish that a given sale would have been made but for the infringement, the patent holder is entitled to at least a reasonable royalty. Panduit Corp. v. Stahlin Bros. Fibre Works, Inc., 575 F.2d 1152, 1157 (6th Cir. 1978).

4. The total award may be mixed or split between lost profits for actual damages and a reasonable royalty based on lost sales for the remainder. *See* TWM Mfg. Co., Inc. v. Dura Corp., 789 F.2d 895 (Fed. Cir. 1986); Radio Steel & Mfg. Co. v. MTD Products, Inc., 788 F.2d 1554 (Fed. Cir. 1986); Gyromat Corp. v. Champion Spark Plug Co., 735 F.2d 549 (Fed. Cir. 1984).

5. Where a process or method patent is involved, the damage award may be based upon the sales of products made by the infringing process. *See* Central Soya Co. Inc. v. Geo. A. Hormel & Co., 581 F. Supp. 54 (W.D. Okla.), aff'd, 723 F.2d 1573 (Fed. Cir. 1983). The entire market value rule allows for the recovery of damages based upon the value of the entire apparatus when the feature patented constitutes the basis for customer demand. TWM Mfg. Co., Inc., 789 F.2d at 901.

6. One way in which the patent holder can meet the burden of proving lost sales/lost profits is to prove: (a) that there was a demand for the product produced by the patented method; (b) that there was an absence

of any acceptable non-infringing substitute; (c) that the patent holder had the manufacturing and marketing capability to exploit the demand; and (d) the amount of the profit the patent holder would have made. Central Soya Co., Inc., 723 F.2d at 1578; Panduit Corp., 575 F.2d at 1156. However, this is not the exclusive test for establishing entitlement to lost profits. In Bio-Rad Laboratories, Inc. v. Nicolet Instrument Corp., 739 F.2d 604, 616 (Fed. Cir. 1984), the Court asked (a) whether the patent holder and infringer aimed their marketing efforts at the same geographic areas and categories of customers; (b) whether there were any particularly close substitutes for their products; and (c) whether the patent holder had existing or at least potential manufacturing and marketing capabilities.

7. Regardless of the test employed, the amount of lost profits cannot be based upon speculation. However, the amount need not be proven with unerring precision. Bio-Rad Laboratories, Inc., 739 F.2d at 615-616. The patentee must provide proof to a reasonable probability that it would have made the sale except for the infringement. Del Mar Avionics, Inc., 836 F.2d at 1326.

8. In the liability phase of this case, the Court held that:

> Both sides admit that there was a great need to develop foam insulated heaters in the late 1970's. The patented method solved these problems, and was apparently the first to do so in the water heater industry. [Court Doc. 74, p. 17-18].

Under the doctrine of the law of the case, the Court will not now reconsider its previous finding that the patented method fulfilled a long-felt need in the industry. *See* Central Soya Co., Inc., 723 F.2d at 1580.

9. State met its burden of proving that there was a demand for foam insulated water heaters made using the patented method. The substantial sales by Mor-Flo/American considered alone are themselves convincing evidence of the demand for water heaters foamed using the patented method. If there had been no demand for foam insulated water heaters made using the patented method Mor-Flo/American, along with several other manufacturers in the water heater industry, would not have run the risk of infringement. Gyromat Corp., 735 F.2d at 552.

10. State met its burden of proving that it had the manufacturing and marketing capability to exploit the demand for foam insulated water heaters made using the patented method.

11. State met its burden of proving that there were no acceptable non-infringing alternatives in the market place at the time the infringement began and during the period of the infringement.

12. A device or technique that enters the market after the date of infringement cannot be treated as an available substitute for the purpose of calculating patent damages. *See* Central Soya Co., Inc., 723 F.2d at 1579.

13. It is clear that Mor-Flo/American did not consider fiberglass to have the advantages of the patented method in the market place. In fact, Mor-Flo/American selected foam over fiberglass. Since Mor-Flo/American ignored fiberglass as a substitute while it sold foam manufactured by the patented method, its acceptable substitute argument is viewed as being of limited influence. *See* TWM Mfg. Co., Inc., 789 F.2d at 901-902.

14. The same evidence which supports the validity of the Denton patent also helps to prove the absence of a non-infringing substitute. Panduit Corp., 575 F.2d at 1162. In Panduit Corp., Judge Markey stated:

> "The patent owner who had proved a long-felt need for a particular invention has a lighter burden in establishing that his customers, as well as the infringer's customers, were in fact seeking to obtain the patented solution to such a need or problem. The other side of the coin involves a strong showing by the infringer that although the patent may have embodied some trifling improvement which was patentable to a narrow extent, such improvement did not create any preference for the patented product rather than a non-infringing substitute . . . ."

Panduit Corp., 575 F.2d at 1162 (quoting 3 R. White, § 9.03 [2]).

15. A device or technique that is covered by a third party patent is not a substitute available to the infringer. Smith International, Inc. v. Hughes Tool Co., 229 USPQ 81, 94 (C.D. Cal. 1986).

16. State has shown that there is a reasonable probability that, but for Mor-Flo/American's infringement, State would have obtained its market share of Mor-Flo/American's directly competitive infringing sales. Based upon these market shares (37.28% in 1984; 40.22% in 1985; and 38.29% in 1986), there is a reasonable probability that State lost the following sales due to Mor-Flo/American's infringement:

	Mor-flo Net Sales	State Market Share	State Lost Sales
1984	$24,501,977	37.28%	$9,134,337
1985	$40,542,366	40.22%	$16,306,139
1986	$18,842,960	38.29%	$7,214,969

17. State has also shown that its lost profits associated with these lost sales were its then-existent incremental profits (15.76% in 1984; 16.15% in 1985; and 17.51% in 1986). The incremental income approach is well established and accepted in the law relating to patent damages. Paper Converting Machine Co., 745 F.2d at 22. State's damages based upon its lost profits attributable to Mor-Flo/American's infringing sales are calculated as follows:

	State Lost Sales	State Profit %	State Lost Profits
1984	$9,134,337	15.76%	$1,439,572
1985	$16,306,139	16.15%	$2,633,441
1986	$7,214 969	17.51%	$1,263,293*
Total			$5,336,306

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* Relying on the plaintiff's calculations, the Court notes a $48.00 error.

18. For those sales for which State does not seek lost profits, State is entitled to a reasonable royalty. The reasonable royalty analysis was created to compensate a patent holder when lost profits cannot be proved to a reasonable probability. Panduit Corp., 575 F.2d at 1159.

19. The reasonable royalty analysis creates a hypothetical licensing negotiation between a willing licensor and a willing licensee and determines, based upon this, what reasonable royalty would have been agreed to. Stickle v. Heublein, Inc., 716 F.2d 1550, 1561 (Fed. Cir. 1983). The parties are presumed to be reasonable and prudent businessmen who are trying to reach an agreement. Georgia-Pacific Corp. v. United States Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970).

20. In Georgia-Pacific Corp. v. United States Plywood Corp., 318 F. Supp. 1116 (S.D.N.Y. 1970), *modified and aff'd sub nom.*, Georgia-Pacific Corp. v. U. S. Plywood-Champion Papers, Inc., 446 F.2d 295 (2d Cir.), *cert. denied*, 404 U.S. 870 (1971), fifteen evidentiary factors are listed that are relevant to the determination of a reasonable royalty; the Court may exercise its discretion in evaluating those factors. The Federal Circuit has approved this approach. *See, e.g.*, Railroad Dynamics Inc. v. A. Stucki Co., 727 F.2d 1506, 1518 (Fed. Cir.), *cert. denied*, 469 U.S. 871 (1984); Hanson v. Alpine Valley Ski Area, Inc., 718 F.2d 1075, 1077 (Fed. Cir. 1983).

21. It is important in setting a reasonable royalty to return to the date when the infringement began. Pan-

duit Corp., 575 F.2d at 1158. In this case, the Court has focused its attention on the state of events occurring in May of 1984, when the patent-in-suit first issued. The Court, however, is not confined to examining the facts actually known to each of the parties at the time of the hypothetical negotiation. The "book of knowledge" of later experience can "bring out and expose to light the elements of value that were there from the beginning." Sinclair Rfg. Co. v. Jenkins Petroleum Process Co., 289 U.S. 689, 698 (1933).

22. "[T]he court must assume that both parties were privy to all pertinent information." Datascope Corp. v. SMEC, Inc., 678 F. Supp. 457, 463 (D.N.J. 1988).

23. State has shown that, as of May 1984, State and Mor-Flo/American had enjoyed success and profit by exploitation of the patented method; that, in May of 1984, State and Mor-Flo/American were head-to-head competitors; and that, as of May 1984, gas residential water heaters foamed using the patented method were already a valuable, fully developed and commercially established part of Mor-Flo/American's product line. The hypothetical license would allow Mor-Flo/American to market foam insulated water heaters in direct competition with State. Consequently, State would not have been reasonable in taking a royalty not out of its profit range. Georgia-Pacific Corp., 318 F. Supp. at 1127. The Court has therefore considered the future business and attendant profit State would expect to lose by licensing a competitor. Panduit Corp., 575 F.2d at 1164. In addition, Mor-Flo/American reasonably should

have been willing to pay a higher royalty because Mor-Flo/American's water heaters foamed using the patented method were a valuable part of an established commercially successful product line.

24. The presence of foam insulated water heaters in its product line, allowed Mor-Flo/American to be more competitive in the market, lead to the opportunity to increase profits, and gave Mor-Flo/American the ability to "sell up." These were important benefits which were promoted by Mor-Flo/American in their trade literature in 1984 and before. Anticipated collateral sales result in parties agreeing to higher royalty rates, because more is involved than making the sale of the infringing product. Deere & Co. v. International Harvester Co., 710 F.2d 1551, 1559 (Fed. Cir. 1983).

On the other hand, in May of 1984, the parties would have been aware of the traditionally small profit percentages and intense competition in the water heater industry. This would have operated to decrease the reasonable royalty since Mor-Flo/American would not be expected to agree to pay a royalty which would not also leave them with a reasonable profit.

25. Another factor which operates to increase the reasonable royalty is State's showing of the lack of any acceptable substitutes at the time infringement began for products manufactured in accordance with the patented method. Panduit Corp., 575 F.2d at 1160-64. However, even though fiberglass was not an acceptable non-infringing substitute for foam, fiberglass was

available and was being used in the marketplace in May of 1984. In the competitive water heater industry with traditionally small profit percentages, reasonably prudent business men would have recognized that a manufacturer, such as Mor-Flo/American, would choose a less desirable product line which generated a reasonable profit rather than a much more desirable product line which with the royalty payment would not generate a reasonable profit. This would operate to reduce the reasonable royalty.

26. Mor-Flo/American's proposed approach to determine a reasonable royalty is based upon a would-be cost differential between the patented method and Mor-Flo/American's present method. However, as State's proofs have shown, Mor-Flo/American's present method is a new method that was not in existence as of May 1984. It was developed in late 1985, well after the focus date. It therefore cannot be used as part of a reasonable royalty analysis based upon events occurring on or before May of 1984. Panduit Corp., 575 F.2d at 1158; TWM Mfg. Co., 789 F.2d at 899.

27. The determination of a reasonable royalty is not based upon the actual profit made by the infringer, but on the royalty to which a willing licensor and a willing licensee would have agreed to at the time the infringement began. Panduit Corp., 575 F.2d at 1158. Mor-Flo/American's actual profits are admissible as probative of anticipated profits, and anticipated profits are a factor to consider in determining a reasonable royalty, Trans-World Mfg. Corp. v. Al Nyman & Sons, Inc., 750 F.2d 1552, 1568 (Fed. Cir. 1984); nevertheless,

the evidentiary status of Mor-Flo/American's profits is not "designed to insure the anomalous result of guaranteeing an actual profit to an infringer." Panduit Corp., 575 F.2d at 1164.

28. Among the evidentiary factors set forth in the Georgia-Pacific case (318 F. Supp. at 1120) that the Court considers relevant to this case are:

(a) the commercial relationship between State and Mor-Flo/American as direct, head-to-head competitors in the U.S.;

(b) the value of having a foam insulated water heater as part of a "full line" of water heater products;

(c) the established profitability of products made by the patented method, and their commercial success;

(d) the intensely competitive nature of the water heater industry and the traditionally small profit percentages;

(e) the opinion testimony of qualified experts;

(f) the amount that a reasonably prudent licensee, voluntarily trying to reach an agreement, would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable to a prudent licensor;

(g) the advantages and benefits of the patented method over the prior art;

(h) the lack of any viable non-infringing substitute, although one less desirable alternative would be available if the royalty were set too high and did not allow for a reasonable profit, and

(i) the extent to which Mor-Flo/American made use of the invention and the commercial benefits received by Mor-Flo/American.

29. Based upon the evidence, the Court concludes that State is entitled to a reasonably royalty of 3%. This royalty is to be applied to the portion of Mor-Flo/American's sales for which State does not seek lost profits. The reasonable royalty is calculated as follows:

1984	$15,367,640	X	3%	=	$461,029
1985	$24,236,227	X	3%	=	$727,087
1986	$11,627,991	X	3%	=	$348,840
Total			$1,536,956		

30. The setting of a reasonable royalty after infringement cannot be viewed as the equivalent of ordinary royalty negotiations between a truly willing patent owner and a truly willing licensee. Judge Markey has stated that this view "would constitute a pretense that the infringement never occurred." Panduit Corp., 575 F.2d at 1158.

31. Based upon the evidence, the Court concludes that, under the circumstances presented in this case,

there is no need tO increase the reasonable royalty as requested by State, since the 3% reasonable royalty previously announced herein is "adequate to compensate for the infringement" (35 U.S.C. § 284) by Mor-Flo/American.

32. State is entitled to prejudgment interest. The Federal Circuit has held that "ordinarily prejudgment interest should be awarded on both the lost profits and the royalty portions of the damages awarded for patent infringement." Gyromat Corp., 735 F.2d at 556. Based on the evidence in this case, the Court concludes that there is no justification for withholding an award of prejudgment interest.

33. State is entitled to a recovery of prejudgment interest from the date of each increment of infringing sales to the date actual payment of damages is made. General Motors Corp. v. Devex Corp., 461 U.S. 648 (1983).

34. The prejudgment interest shall be based upon the prevailing prime rates during the period of infringement, and shall be compounded on a quarterly basis. The Federal Circuit has approved prejudgment interest based upon the prevailing prime rate. Lam, Inc. v. Johns-Manville Corp., 718 F.2d 1056 (Fed. Cir. 1983). The Federal Circuit has also approved the calculation of such interest on a compounded basis. Dynamics Corporation of America v. The United States, 766 F.2d 518, 519-520 (Fed. Cir. 1985).

35. The Court awards prejudgment interest in the amount of $1,896,616 (calculated in accordance with Finding No. 39).

36. The Court has the discretion to increase the amount of damages under the provisions of 35 U.S.C. § 284 which in pertinent part provides:

> When the damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed.

37. The court also has the discretion to award reasonable attorney fees under the provisions of 35 U.S.C. § 285 which provides:

> The court in exceptional cases may award reasonable attorney fees to the prevailing party.

38. Willful infringement is determined by reviewing the totality of the circumstances. Central Soya Co., Inc., 723 F.2d at 1577.

39. When Mor-Flo/American received actual notice of State's patent rights in 1984, an affirmative duty arose to exercise due care to determine whether or not they were infringing State's patent. Underwater Devices Inc. v. Morrison-Knudsen Co., 717 F.2d 1380, 1389 (Fed. Cir. 1983). The affirmative duty entailed under the circumstances obtaining competent legal advice before continuing in any potentially infringing activity. Spindelfabrik Suessen-Schurr Stahlecker & Grill v. Schubert & Salzer Maschinenfabrik Aktienge-

sellschaft, 829 F.2d 1075 (Fed. Cir. 1987), *cert. denied*, 108 S. Ct. 1022 (1988). Under the totality of the circumstances presented in this case, Mor-Flo/American's affirmative duty of due care was particularly strong, because Mor-Flo/American had earlier purposefully patterned its foaming method upon State's. This is evidence of prior conduct which goes to MorFlo/American's state of mind and the issue of willfulness. Milgo Electronic Corp. v. United Business Communications, Inc., 623 F.2d 645 (10th Cir.), *cert. denied*, 449 U.S. 1066 (1980).

40. Based upon the evidence submitted, under the totality of the circumstances presented in this case, the Court concludes that State failed to establish by clear and convincing evidence that Mor-Flo/American's infringement was willful and deliberate. Although the Court is of the opinion that Mor-Flo/American clearly should have known that their method of foaming water heaters infringed State's patent, the evidence presented was insufficient to establish clearly and convincingly that Mor-Flo/American actually knew of the infringement. Mor-Flo/American did rely on the opinion of counsel, albeit erroneous, that their method did not infringe State's patent.

41. Also, based upon the evidence submitted, the Court concludes that there are no exceptional circumstances in this case to justify an award of attorney's fees.

42. Mor-Flo/American's request for sanctions is denied.

ENTER:

/s/_____
THOMAS G. HULL
UNITED STATES DISTRICT JUDGE

STATE INDUSTRIES, INC.,
Plaintiff,

v.

MOR-FLO INDUSTRIES, INC.,
Defendant.

STATE INDUSTRIES, INC.,
Plaintiff,

v.

AMERICAN APPLIANCE MFG. CORP.,
Defendant.

Nos. 2-84-276, 2-85-26

United States District Court,
Eastern District of Tennessee
Northeastern Division

Filed July 21, 1988

JUDGMENT ORDER

The accounting for damages in this patent infringement case having been tried to the Court on May 2-3, 1988, it is hereby ORDERED and ADJUDGED that, for the reasons stated in a Memorandum and Opinion filed this day, plaintiff State Industries, Inc. be awarded damages against defendants Mor-Flo Industries, Inc. and American Appliance Manufacturing Corporation as follows:

1.	Lost Profits (based on plaintiff's market share of 40% of defendants' sales)	$5,336,306.00
2.	Reasonable Royalty (calculated at 3% of the balance of defendants' sales)	$1,536,956.00
3.	TOTAL	$6,873,262.00
4.	Prejudgment Interest (through June, 1988, based on Total, Line 3)	$1,896,616.00
5.	Total Damages Awarded	$8,769,878.00

ENTER, this 21[st] day of July, 1988.

/s/

THOMAS G. HULL
UNITED STATES DISTRICT JUDGE

STATE INDUSTRIES, INC.,

v.

MOR-FLO INDUSTRIES, INC. and
AMERICAN APPLIANCE MFG. CORP.,

Case Number CIV-2-84-276
and CIV-2-85-26

United States District Court,
Eastern District of Tennessee
Northeastern Division

September 2, 1988

AMENDED JUDGMENT IN A CIVIL CASE

Decision by Court. This action came to trial or hearing before the Court. The issues have been tried or heard and a decision has been rendered.

IT IS ORDERED AND ADJUDGED that the plaintiff, State Industries, Inc., is entitled to prejudgment interest for the period from May 4, 1984 up to the entry of judgment on July 21, 1988 in the total amount of $2,011,409.00.

DON K. FERGUSON, ACTING CLERK

/s/ Elaine Milligan

Deputy Clerk

Date: September 2, 1988

STATE INDUSTRIES, INC.,
Appellee,

v.

MOR-FLO INDUSTRIES, INC. and
AMERICAN APPLIANCE MFG. CORP.,
Appellants.

No. 86-1452

United States Court of Appeals,
Federal Circuit

March 3, 1987

Before MARKEY, Chief Judge. DAVIS and SMITH, Circuit Judges.

SMITH, Circuit Judge.

DECISION

Mor-Flo Industries, Inc., and American Appliance Mfg. Corp. appeal from the May 29, 1986, judgment of the United States District Court for the Eastern District of Tennessee holding patent No. 4,447,377 valid and infringed. We *affirm*.

OPINION

State Industries, Inc. (State), is the owner of a patent, No. 4,447,377 ('377 patent), for a method of insulating a water heater. The method involves the use of a plastic envelope to contain the liquid foam while it

rises, and to prevent the foam from invading areas, such as the electrical components and the combustion chamber, that must be kept free of foam.

Mor-Flo Industries, Inc., and American Appliance Mfg. Corp. (Mor-Flo) contend here, as they did below, that the '377 patent is invalid either because a product made by the process was offered for sale more than 1 year before the application was filed, or because the method would have been obvious to one of ordinary skill in the art. Mor-Flo also argues that, even if the '377 patent is valid, its process does not infringe State's patent.

The district court rejected Mor-Flo's on-sale defense because it found that Mor-Flo had failed to carry its burden of proof on the issues whether the product offered for sale was produced by the patented process, and whether the method was reduced to practice before the critical date. The district court also held that the invention would not have been obvious to one of ordinary skill in the art and concluded that the patent was valid. It held that Mor-Flo's sleeve fell within the meaning of the term "envelope" as used in the patent, and found that Mor-Flo's process infringed State's patent directly or under the doctrine of equivalents.

Claim Interpretation

Mor-Flo argues that the district court erred in interpreting the claim at issue. Mor-Flo contends that its sleeve is not an envelope within the meaning of the claim because an envelope must have two walls and its sleeve has only one. The district court rejected this position based on the testimony of State's expert, the

language of the specification of the patent, and the rules of claim interpretation. The court disregarded the testimony of Mor-Flo's expert because he disagreed with the proposition that the limitations of narrow claims cannot be read into broader ones. The court found that this misstatement or misunderstanding of the law seriously undermined his credibility.

Claim interpretation is a question of law. ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 USPQ 929 (Fed.Cir. 1984). Thus, the district court's interpretation of the claim is not subject to the clearly erroneous standard of review. Raytheon Co. v. Roper Corp., 724 F.2d 951, 220 USPQ 592 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 835 (1984).

There was no error in the district court's interpretation of the claim. The court considered the claim in light of the specification and correctly noted that the limitations of narrower claims cannot be read into broader ones. Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983), *cert. denied*, 465 U.S. 1026 (1984), *overruled on other grounds by* SRI International v. Matsushita Electric Corp. of America, 775 F.2d 1107, 227 USPQ 577 (Fed. Cir. 1985); Yarway Corp. v. Eur-Control USA, Inc., 775 F.2d 268, 227 USPQ 352 (Fed. Cir. 1985). Claims 2 and 3 limit the envelope to a double-walled structure, but claim 1 contains no such limitation.

Mor-Flo claims the district court also erred by interpreting the claim one way for validity purposes and a different way for infringement purposes. This contention is based on Mor-Flo's argument that its

sleeve is not an envelope and, thus, has no merit in light of the determination that the district court properly interpreted the claim.

Obviousness

In Graham v. John Deere, 383 U.S. 1, 148 USPQ 459 (1966), the Supreme Court set out guidelines to be used in determining whether a patent would have been obvious to one of ordinary skill in the art at the time the invention was made. The findings required by Graham concern the scope and content of the prior art, the differences between the prior art and the claims at issue, the level of ordinary skill in the art, and any objective evidence of nonobviousness presented. Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983). Mor-Flo contends that the district court did not make these required findings. There is no doubt that Mor-Flo is correct that no finding was made on the level of skill in the art. The district court made no mention of this factor. However, we find no evidence in the record directed to this question. Mor-Flo cannot complain of the failure of the court to address this issue since it did not present any evidence on a question on which it had the burden of proof. Eaton Corp. v. Appliance Valves Corp., 790 F.2d 874, 229 USPQ 668 (Fed. Cir. 1986).

With regard to the other findings required by Graham, it is clear that the district court did make the necessary findings. Mor-Flo's argument concerning the lack of findings is limited to consideration of the section of the opinion labeled "Obviousness." Mor-Flo failed to consider the discussion of the prior art and the secondary considerations contained in the infringement

section. There, the court went through a detailed analysis of the prior art relied on by Mor-Flo's expert to show obviousness. The court found that the Japanese patent relied on by Mor-Flo had limited applicability to the patent in suit because it did not contain a description of how the structure was put together. The court also concluded that the examiner had prior art similar to both the Japanese patent and the HUD process before him during the examination. Mor-Flo has shown no clearly erroneous findings by the district court concerning the scope and content of the prior art or the differences between the prior art and the claims at issue.

In addition, the district court considered the objective evidence of nonobviousness. The court found that there was a great need to develop foam insulated heaters and that preventing leakage of the foam was a difficult problem faced by the industry in this development. The court also considered the testimony regarding Mor-Flo's purchase and disassembly of State's water heater prior to developing its own foam insulated water heater to be particularly damaging. Mor-Flo has not shown any of these findings to be clearly erroneous.

Thus, the district court's conclusion of nonobviousness is supported by the required findings, and Mor-Flo has failed to show that the district court committed any error.

Infringement

Mor-Flo argues that the district court erred in its infringement analysis because it failed to consider all of

the requirements of the claim and it compared Mor-Flo's device with one of the figures in the patent. Mor-Flo's arguments are without merit. The district court stated that "[t]here is no question that the defendants' process includes steps 2 through 5 of the patented claim if the plastic 'sleeve' is a plastic 'envelope'." The court then proceeded to find that Mor-Flo's sleeve was an envelope for purposes of the claim. The court did find that "[i]n fact, the sleeve and the figure 5 embodiment (partial envelope) are identical structures which are simply secured differently at the bottom of the tank." But, it was not error for the district court to consider the claims in light of the specification. Mor-Flo has failed to demonstrate any error by the district court.

Mor-Flo also argues that the district court erred in finding its method infringed State's patent under the doctrine of equivalents. It claims that, by broadening the claims in suit to cover its sleeve, the claims also read on the Japanese patent. The only testimony offered by Mor-Flo on this issue was that of its expert, whose credibility the court found to be undermined. The district court also found that the applicability of the Japanese patent was limited because it did not explain how the structure was put together. Therefore, Mor-Flo has failed to demonstrate any error by the court in its application of the doctrine of equivalents.

Section 102(b) Defense

Mor-Flo contends that State's patent is invalid because a product produced by the patented process was on sale more than 1 year prior to the application

date. Mor-Flo relies on the price lists distributed to State's customers for foam insulated water heaters and the model displayed at a trade show to prove the on-sale bar. The district court considered this evidence and concluded that it did not show that an offer was made of a product produced by the patented method because other methods of foaming heaters were known and there was no indication of how the heaters were to be produced, or how the model was made. Mor-Flo has not shown any error by the district court on this issue.

Finally, Mor-Flo argues that the district court erred in concluding the method was not reduced to practice prior to the critical date. The district court found that the heater tested by Underwriters Laboratories (UL) was not made by the patented method because it did not use an envelope. The court determined that the bag used on that heater did not envelop the tank as the patent contemplated, was not used to contain the foam, and had not demonstrated that it would work for its intended purpose. For these reasons, the court concluded that the UL heater was not a successful reduction to practice. Mor-Flo has failed to show that the district court committed error in rejecting Mor-Flo's section 102(b) defense.

STATE INDUSTRIES, INC.,
Plaintiff,

v.

MOR-FLO INDUSTRIES, INC.,
Defendant.

STATE INDUSTRIES, INC.,
Plaintiff,

v.

AMERICAN APPLIANCE MFG. CORP.,
Defendant.

Nos. 2-84-276, 2-85-26

United States District Court,
Eastern District of Tennessee
Northeastern Division

May 29, 1986

Before HULL, Judge.

MEMORANDUM AND ORDER

This is a patent infringement action in which State Industries, Inc. (State) alleges that a method claim of its Patent No. 4,447,377, which details a method of insulating the exterior of a water heater tank, has been infringed by defendants Mor-Flo Industries, Inc. (Mor-Flo) and American Appliance Manufacturing Corporation (American). All three companies manufacture and sell foam insulated water heaters. This lawsuit revolves

around a process used in insulating a water heater with foam. The issues presented are whether State's patent is valid and enforceable; and, if so, whether the methods used by Mor-Flo and American to insulate their gas water heaters with foam infringe the method patented by State. The Court will first examine the issue of patent validity and then the issue of patent infringement.

Patent Validity

Defendants contend that State's patent is invalid and therefore unenforceable because of State's prior public use of the patented method, 35 U.S.C. §102 (b), American's prior invention of the patented method, 35 U.S.C. §102 (g), the obviousness of the patented method from the prior art, 35 U.S.C. §103, and the inequitable conduct through which the patent was obtained.

At the outset it must be noted that State was issued United States Patent No. 4,447,377 which is duly registered and on file with the Patent and Trademark Office, and that such patent is entitled to a presumption of validity in this Court, 35 U.S.C. §282. The party challenging the validity of the patent bears the burden of proof, *id.*, and it must overcome the presumption of validity by clear and convincing evidence. Pennwalt Corp. v. Akzona Inc., 740 F.2d 1573 (Fed. Cir. 1984).

Prior Public Use Or On Sale Defense

With these standards in mind we turn first to the prior public use or "on sale" defense asserted by defendants. 35 U.S.C. §102 (b) provides in pertinent part:

> A person shall be entitled to a patent unless (b) - the invention was . . . in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States . . . .

In order to prevail on this defense in the context of a method claim infringement case, the defendants must prove by clear and convincing evidence that more than one year prior to the patent application date the product produced by the patented process was placed on sale; and, that the patented process had been successfully reduced to practice. D.L. Auld Co. v. Chroma Graphics Corp., 714 F.2d 1144 (Fed. Cir. 1983); CTS Corp. v. Piher International Corp., 593 F.2d 777 (7th Cir. 1979). In other words, if State had produced a water heater by the patented method containing foam insulation and offered for sale such a water heater prior to December 10, 1978,[1] which is one year prior to the application date of the patent, "the right to a patent on the method must be declared forfeited." D.L. Auld Co. v. Chroma Graphics Corp., *supra* at 1147.

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[1]. The patent application date for U.S. Patent No. 4,447,377 is December 10, 1979. The date one year prior thereto is referred to as the "critical date".

It is unnecessary that State have actually begun production by the patented method or that State have had products produced by the patented method in stock and available for sale on the critical date. *Id.* It is enough if, assuming State had placed the water heater produced by the patented method on sale, it had simply made one water heater following every step of the claimed method prior to the critical date.

On the other hand, it would be of no consequence insofar as this defense is concerned, if State had an entire warehouse full of water heaters produced by the patented method so long as they did not offer these water heaters for sale or allow their public use prior to the critical date.

The facts in this case on these issues are not disputed for the most part. The inferences to be drawn from the facts are, however, greatly disputed. Neither element of the defense is beyond dispute. We will initially determine whether products produced by the patented method were placed on sale prior to the critical date, and then determine whether there had been a reduction to practice of the patented method prior to the critical date.

On February 22, 1978, State distributed price lists to its customers for its Censible and Superlife water heaters with foam insulation. These price sheets were effective May 22, 1978, before the critical date. There is testimony and documentary evidence to the effect that these price lists were made in error and that the situation was rectified. Nevertheless, subsequent price lists distributed in the summer of 1978, which were ef-

fective August 5, 1978, (before the critical date), also contained listings for foam insulated Censible and Superlife water heaters and perpetuated the alleged error. State argues that these price sheets were not offers to sell, and points to the disclaimer on the back of each sheet which reads, "This price sheet does not constitute an offer to sell." Although in the technical contract sense of the word, the price sheets may not have constituted on "offer", in the realistic patent law sense of the term, publication and distribution of these price sheets was certainly sufficient to constitute an offer for sale of the products described therein notwithstanding the disclaimer. There was a definite price listed for various models, and the representation was implicit in the document that these models would be available for sale on the effective date of the price sheet. Thus, the Court finds that distribution of these price sheets throughout the trade did constitute an offer for sale of the products listed thereon. However, the Court finds that the defendants have failed to carry the burden of establishing by clear and convincing evidence that this was an offer for sale of products produced by the patented method. For this reason, the Court finds no need to discuss whether the offer was effectively rescinded by State.

The price sheets simply inform us that the Censible and Superlife water heaters offered would be foam insulated. They make no mention of the patented process in which a plastic envelope is placed between the tank and the outer jacket cover to contain the foam and prevent leakage. They do not indicate that any new method for foaming water heaters had been conceived or would be used. At the time these sheets

were being distributed, State was foaming its HUD mobile home water heaters by a process which did not include the use of a containment device within the jacket of the heater, and, as counsel for defendants elicited during his cross-examination of Herbert Lindahl, State's President, there are other ways to foam water heaters which are not covered by State's patent. Thus, the simple advertising of foam insulated water heaters by State cannot be said to point to the patented process without more.

In the Auld case, the offer to sell was accompanied by samples of the product made by the patented method. There was, therefore, no question but that Auld's patent was forfeited because it placed the product produced by the patented method on sale prior to the critical date. The offer for sale in Auld was specifically directed to that product which the patented method would produce. No such specificity exists in the instant case and thus the defendants have failed to carry their burden with clear and convincing evidence. *See also*, Barmag Barmer Maschinenfabrik Ag v. Murata Mach., Ltd., 731 F.2d 831 (Fed. Cir. 1984) (Patent invalid where offer for sale made at time of demonstration using a model which embodied every aspect of the patented product); Shatterproof Glass Corporation v. Libbey-Owens Ford Co., 758 F.2d 613 (Fed. Cir. 1985) (Patent valid where orders solicited using samples which were not produced by the patented method).

Defendants contend that a cut-a-way model of a foam insulated water heater was displayed by State at a trade show, and that this display model provides the specificity necessary to establish that the offer for sale

was of the product produced by the patented method. From the evidence in the record however, there is no indication that this cut-a-way model was prepared by the patented method. There was no testimony that the model displayed a foam containing plastic envelope. All we know from the testimony is that the model displayed foam insulation. This model provides us with no more specificity than the price sheets themselves. It is not clear and convincing evidence that the product of the patented method was offered for sale prior to the critical date.

Similarly, the Court finds that defendants have failed to carry their burden of proof on the element of reduction to practice. To find a reduction to practice an invention "must have been 'sufficiently tested to demonstrate that it will work for its intended purpose.'" *Id.* at 623 (citation omitted). In this case the invention is a method of insulating a water heater using a plastic envelope to contain the foam insulation within the jacket cover.

In June of 1978 State produced an experimental foam insulated water heater using a "window bag" within the jacket cover. This heater was sent to Underwriter's Laboratories for testing, and received UL approval in August, 1978. Defendants assert that this heater was a successful reduction to practice, albeit by hand, of the patented method. If each step of the patented method was embodied in the production of this heater, and it demonstrated that it would work for its intended purpose, then it was a successful reduction to practice whether it was commercially viable or not.

Under cross-examination, Ernest Wenczl, State's Vice President for research and development testified that the "window bag" was an "envelope" which was "wrapped around" the tank of the hot water heater, and there is no question that the jacket was put on over the bag, a cover was installed on top of the jacket, and foam was introduced into the bag via an opening in the cover. It would thus appear to be a successful reduction to practice. Mr. Wenczl also testified, however, that this heater was not, in his opinion, covered by the patented process. His contradictory testimony is made so by his admittance that the window bag was an envelope. It is the Court's opinion that this bag was not an envelope. The "windows" in the bag were to be placed around the electrical components to prevent their invasion by the foam. The bag was only twenty-two inches in width and thus only extended partially around the tank. Slots were cut in the bag to allow the foam to escape from the bag and, hopefully, fill in the remaining space between the jacket and the tank. This bag did not envelop the tank as the envelope in the patent contemplates. Moreover, it was not used to contain the foam within the jacket, but merely to prevent the foam from invading the electrical components and from escaping while in its initial liquid condition. Since this test heater did not actually utilize an "envelope" it did not constitute a successful reduction to practice of the method claim in State's patent. In addition, there is some testimony that this bag had not successfully demonstrated that it would work for its intended purpose.

Defendants point also to the cut-a-way model displayed at the trade show as evidence of a reduction to practice. Again, there is no evidence that this model

was produced by the patented method. There is no evidence that it showed a plastic envelope wrapped around the tank containing the foam. The evidence only shows that this model contained two inches of foam insulation. It could have been prepared using the HUD method or some other method. We must presume the validity of the patent. We cannot simply surmise that a model or sample was produced by a patented method when other methods were available and were known.

Since the Court has found that the defendants have not proven by clear and convincing evidence that the product of the patented method was offered for sale or reduced to practice prior to the critical date, the plaintiff's patent is not invalid as being placed in prior public use or on sale within the meaning of 35 U.S.C. §102 (b).

Prior Invention

Defendants next claim that the State patent is invalid because the claimed method was invented by an American employee prior to the invention by State's employee. 35 U.S.C. §102 (g) provides in pertinent part:

> A person shall be entitled to a patent unless - (g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed or concealed it.

The defense of prior invention requires proof that the invention was conceived, reduced to practice and

not abandoned, suppressed or concealed. International Glass Co. v. United States, 408 F.2d 395 (Ct. Claims 1969). An invention is deemed abandoned, suppressed or concealed "if, within a reasonable time after completion, no steps are taken to make the invention publicly known." *Id.* at 403.

In this case, we have testimony from Mr. Robert Zuck, a former American engineering employee, and Mr. Henry Moore, Vice President of Engineering for American, that in early 1978 Mr. Zuck came up with the idea of using a plastic shipping bag pulled over the tank of the water heater and doubled back up on itself inside the jacket to contain foam. They indicate that several water heaters were actually foamed using this process, and thus it was successfully reduced to practice. Both men stated that a demonstration of this process was made for Walter Abt, the company's president, in February or March of 1978; that an envelope configuration was conceived in the spring of 1978; that Kleerpak, a bag supplier, was enlisted in April of 1978 to produce some sample envelope-type bags; that these samples were received and that a test run of twenty-five water heaters was made by using the Kleerpak envelope bags to contain foam. Beryl Weiner of Kleerpak corroborated the testimony that Kleerpak discussed a foam-containing bag with American employees, and that Kleerpak produced some number of sample envelope-type bags for American. Both Zuck and Moore testified that these envelope bags were wrapped laterally around the tank, were open at the top, and were filled with foam through the open top. It would appear from this testimony that American employees did conceive the patented method and reduce it to practice by

two different embodiments by the summer of 1978, before State. There are however some circumstances which weigh against this conclusion.

Mr. Zuck admits to having spent several hours preparing for his testimony and that his recollection had been refreshed by defendants' attorneys on several points. Although both Zuck and Moore testified to performing a demonstration of foaming using the shipping bag, there was no testimony from Mr. Abt confirming this event. Zuck also recalled that Jim Starke, then vice president and general manager of American, was present at the demonstration. Mr. Starke did testify, and he did not recall ever seeing a foam containing bag used in a water heater until a State foam insulated product was purchased by American and disassembled, revealing the plastic bag used by State. Although Mr. Starke's memory for dates appeared suspect on cross-examination, it should also be born in mind that he did not meet with State's attorneys at any time to prepare his testimony. Mr. Starke testified that American, in seeking to develop a viable foam insulated water heater, was having problems containing the foam within the jacket of the heater, and that this prompted the purchase and tear down of the State heater.

Edward Taylor, Vice President of Engineering for Mor-Flo, testified that he first received information on a foam-containing bag from American in late 1980 or early 1981; that in early 1980 Mor-Flo purchased an electric, foam insulated, State water heater which was tested and torn down; and that Mor-Flo first began

production using its "sleeve" to contain foam in mid-1981.

Two letters from Mr. Abt provide additional evidence pointing to the lack of development of a successful or satisfactory foam insulating procedure by American/MorFlo prior to 1980. In May 1979 Mr. Abt wrote James Bridegum of American, memorializing several manufacturing matters discussed at the annual shareholders meeting." Item six in the letter states:

> 6. We stressed the need for developing a full line of foamed water heaters in order to cut down the tremendous freight cost of shipping energy saver with fiberglass insulation. There is a paramount and definite need for acceleration of this program.

In July 1979 Mr. Abt wrote Jack Moore of American and Bob Montgomery of Mor-Flo in regard to development of a manufacturing process for foam insulated heaters. Mr. Abt stated,

> From what I am hearing in the field, our competitors are ahead of us in the manufacturing of heaters with foam. I expect to receive from you on Monday of each week our program on developing a final manufacturing process to produce our water heaters with foam.

If American employees had successfully developed two methods of foam containment using plastic bags in early 1978, it seems odd that they would not have shared this information with their counterpart at Mor-Flo, Mr. Taylor, and that Mr. Abt would express such concern over the development of a foam insulating

manufacturing process. Also weighing heavily against the testimony of Zuck and Moore is the basically "unexplained absence of the kind of evidence we would normally expect to see in a case of this kind, *viz.*, [American]'s records of the development, testing and production of the device [American] alleged it had reduced to practice." CTS Corp. v. Piher International Corp., *supra*, at 780.

Defendants produced four quarterly engineering reports prepared by Moore in 1978 which make reference to development of foam insulated heaters. The report for the first quarter indicates that American foamed five experimental heaters, but does not indicate how. It is also noted that engineering was "awaiting sample plastic bags used in foaming. Expect sample by May 1, 1978." In the second quarterly report it is noted that the sample was received and that a test run on twenty-five electric heaters would be made on July 20, 1978. That is the last we hear about plastic bags, as far as documentary evidence is concerned, until the "Outline of Engineering Goals for 1981." The final two quarterly reports for 1978 refer to foaming attempts by the CPR division of Upjohn and mention leakage problems and the experimentation of various sealing methods. The outline of engineering goals for 1981, prepared by Mr. Moore, lists as item or goal six: "Foaming-Gas Water Heaters - Sample plastic bags were to arrive by Jan. 5th. Samples are now to be delivered Feb. lst. Production line is being prepared for foaming." The indication is that prior to 1981

American had not successfully developed a procedure for foam containment, at least in their gas heaters.[2]

American has no drawings or records prior to 1981 which display or refer to foam containment by plastic bags. Zuck testified that sample heaters using plastic bags were sent to UL and AGA[3] for testing in 1978 and that a description and drawings of the heater would have been sent with the samples. No correspondence between American and UL or AGA was produced. No such drawings or descriptions of the water heaters were produced. No records from either UL or AGA were produced.

By way of contrast, and, as would be expected, the record is replete with examples of drawings and descriptions of various bags and heaters conceived by State employees in the process of developing the patented method. The lack of documentary evidence and the inconsistencies between the testimony of the two American engineering employees and Abt, Starke and Taylor militate against a finding that defendants have carried their burden of proof on the issue of prior invention.

Even if American employees had conceived and reduced to practice the invention claimed by State, the

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2. American/Mor-Flo do not use plastic sleeves or bags to contain foam in their electric heaters.

3. Underwriter's Laboratories and American Gas Association.

Court finds that this prior invention was abandoned, suppressed or concealed.

Although Zuck and Moore claim to have made a demonstration for Walter Abt, Mr. Abt did not confirm this, and there is no evidence that they or anyone else took any step to make the invention publicly known. No patent application was filed. The invention was not described in any document, much less a publicly disseminated document. The invention was not demonstrated publicly. It was not even shared with American's parent corporation, Mor-Flo. Apparently the idea was abandoned or shelved by American engineers until 1981 when the "sleeve" method was developed. "Their work lay dormant, did not enrich the art, and thus 'remained secret, effectively concealed and suppressed until exhumed by . . . [defendant] for the defense of this case.'" International Glass Co. v. U.S., *supra*, at 403 (citation omitted). Based upon these facts the Court concludes that even if American employees did invent the claimed method prior to State, this invention was abandoned, suppressed or concealed, and thus, the defense of prior invention must fail.

Obviousness

Defendants claim that State's patented method for insulating a water heater is invalid as obvious in view of the prior art. 35 U.S.C. §103 provides that:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in Section 102 of this title, if the differences between the subject matter sought to be patented and the

> prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Defendants' expert, Mr. George Thomas, testified that the patented claim would have been obvious from the prior art. Mr. Thomas relied upon the HUD process of foaming without an envelope or bag, and a Japanese patent which does show a bag for containment of foam insulation on a thermos-type product, for his opinion that the method claimed was obvious. The implication was that the patent examiner did not have these prior art references before him during his examination of State's application. However, as was pointed out during Mr. Thomas' cross examination, the Japanese patent was from a class, subclass which the patent examiner searched in connection with his examination of the application. And, even though the HUD process itself may not have been before the examiner, there were several other prior art references made by the examiner, at least two of which were to water heaters, which disclosed the use of foam insulation in a cavity without a bag. Mr. Thomas admitted that the examiner knew about foaming water heaters without a bag for containment, like the HUD process, and that he had the Japanese patent before him during his search. Thus, the examiner knew about the prior art relied upon by Mr. Thomas as demonstrating obviousness, yet he did not find the method obvious, and did not even cite the Japanese patent. In addition, the examiner did cite other patents similar to the Japanese patent and thus was well aware of the concept embodied there. The patent examiner is an

expert in this field and that is why patents come into Court with a presumption of validity which can only be overcome by clear and convincing evidence. The patent examiner reviewed the prior art and determined that the patent should be allowed. His opinion is entitled to great weight in the absence of proof that pertinent prior art or other evidence was not considered during his examination. *See*, American Hoist & Derrick Co. v. Sowa & Sons, 725 F.2d 1350, 1359 (Fed. Cir. 1984).

The invention here in dispute is simple and there is an inclination to find such simple things to be obvious. However, if the invention were so obvious why hadn't anyone come up with it, and why were both State and American struggling to come up with some method to prevent foam leakage and invasion of areas such as the combustion chamber of a gas heater? Both sides admit that there was a great need to develop foam insulated heaters in the late 1970's. The patented method solved these problems, and was apparently the first to do so in the water heater industry.

Based upon the opinion of the patent examiner and the circumstances surrounding this invention in the industry, the Court finds that the patent in suit was not obvious within the meaning of 35 U.S.C. §103.

Inequitable Conduct

Finally, defendants contend that State's patent is unenforceable because of the inequitable conduct of State's attorney before the Patent and Trademark Office (PTO). The allegedly inequitable conduct was

the failure of State's counsel, Mr. Peurner, to disclose the HUD foaming process, the circulation of the price sheets, the existence of the UL test heater with the window bag, and the cut-a-way model displayed at the trade show.

Rule 56 of the PTO, 37 C.F.R. 1.56, imposes "a duty of candor and good faith . . . on the inventor, on each attorney or agent who prepared or prosecutes the application and on every other individual who is substantially involved in the preparation or prosecution of the application . . . ." Each such individual must disclose to the PTO information they are aware of which is material to the examination of the application. *Id.* Information is deemed "material where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent." *Id.*

Defendants' expert testified that, in his opinion, the duty of candor and good faith was breached by the failure to disclose the HUD process. As was discussed earlier, the patent examiner did consider prior art references to foam insulated water heaters like the HUD; and, the HUD method is implicitly discussed within the patent itself. In column 4 line 38 of the patent it states, "Without the envelope, elaborate means of sealing would have to be used at points where the vertical outer casing joins the base of the outer casing . . . ."

Defendants also contend that the failure to disclose the UL test heater, the cut-a-way display model and the circulation of price sheets was a material omission.

Since we have no evidence that the price sheets were directed towards the patented method, or that the cut-a-way model was produced by the patented method, the Court cannot say that these were matters of material information which should have been presented to the PTO. As to the UL heater, since the bag used therein was not an "envelope" and therefore not covered by the patent, and since the idea was not successful in terms of producing acceptable foam insulated heaters, and since the heater was not placed in public use, its disclosure would have served no purpose. Accordingly, the Court finds that defendants have failed to prove by clear and convincing evidence that the inventor or patent counsel failed to fulfill the duty of candor and good faith.

The wiser course would be to include information such as the HUD process and the UL test heater in patent applications. However, "simple negligence, oversight or an erroneous judgment made in good faith is insufficient" to constitute inequitable conduct. J.P. Stevens & Co., Inc. v. Lex Tex Ltd. Inc., 747 F.2d 1553, 1560 (Fed. Cir. 1984). There is no indication that anything else was the case in this action.

Having thus concluded that the defendants are unable to overcome the presumption of validity with clear and convincing evidence the Court finds United States Patent No. 4,447,377 to be valid and enforceable. We must next turn to the issue of infringement.

Infringement

It is the method of claim 1 of the patent which State alleges American and Mor-Flo are infringing. Claim 1 states as follows:

> I claim:
>
> 1. The method of insulating a tank comprising the steps of:
> (1) wrapping a plastic envelope around the exterior side wall of the tank;
> (2) installing an outer jacket member around the tank and over the envelope, said jacket member dimensioned so that there will be a space between the tank side wall and the jacket member in which said envelope is positioned;
> (3) installing a cover member on the top of the jacket member to close off the top of the jacket;
> (4) introducing a foam-type insulation material into the envelope through an opening in the cover member, said material when introduced being in the form of a mixture of fluid components which will expand in the envelope and when set will produce a rigid wall of insulating material in the space between the tank wall and the jacket means; and (5) plugging the opening in the cover member through which the foam-type insulation material is introduced.

The principal dispute revolves around the first step of the patented method. Defendants claim that they do not use an "envelope", and that the "sleeve" which they use is not "wrapped" around the tank.

In the American/Mor-Flo method, a cylindrical piece of plastic is pulled over the top of the tank. Fiberglass has been positioned around the combustion chamber at the bottom of the tank. The "sleeve" is taped at the bottom approximately two inches below the top of the fiberglass which surrounds the combustion chamber. The jacket is then installed over the tank and sleeve leaving a space between the jacket and tank. The top is installed and foam is shot into the sleeve through an opening in the top. The foam is in a liquid state when shot in. It comes in contact with the fiberglass, plastic and tank wall at the bottom of the sleeve and is thereby prevented from escaping at the bottom while it expands.

Plaintiffs' expert, Mr. Luedeka, testified that in his opinion, based upon on-site observations of the processes and study of the patent, the file history and the references cited by the examiner, defendants' process infringed State's patent, claim 1, literally and/or by the doctrine of equivalents. There is no question that the defendants' process includes steps 2 through 5 of the patented claim if the plastic "sleeve" is a plastic "envelope". Mr. Luedeka testified that defendants' sleeve was an envelope within the meaning of the patent because it envelops the tank of the water heater just like State's double-walled envelope, and because claim 1 of the patent is not limited to double-walled envelopes as are claims 2 and 3.[4]

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[4] This limitation in claims 2 and 3 is the reason the American/Mor-Flo process is not alleged to infringe those claims.

The patent does contain a drawing and description of a "partial envelope" which is basically a single-walled structure. *See*, Figure 5 and the description thereof in column 4, lines 4-27 of the Patent attached. Reference to this embodiment as a "partial envelope" seems to indicate that an envelope, as the term is used in the patent, refers to a structure which is double-walled and is used to envelop the foam insulation rather than the tank. However, the description goes on to state that "it will be appreciated that in the FIG. 5 embodiment the side wall of [the] tank 76 serves as one wall of the space into which the foam insulation material is injected." Patent, Column 4, Lines 24-27. If the envelope was to envelop the foam, the description would have stated that the side wall of the tank served as the inner wall of the envelope rather than as "one wall of the space" into which the foam is shot. In addition, although the structure is initially referred to as "the partial envelope 78," it is subsequently referenced as "envelope 78." These portions of the description seem to dispel any notions that the term "envelope" in the patent refers only to a double-walled structure that envelops the foam. It appears to the Court that Mr. Luedeka's interpretation is correct in that the envelope envelops the tank, and must not necessarily involve a double-walled structure.

Defendants' expert, Mr. Thomas, testified that in his opinion, the term "envelope", as used in the patent, can refer only to a double-walled structure even though claim 1 does not contain the limitation found in claims 2 and 3: "said envelope having an inner and an outer wall." Patent, Column 5, Line 3. The only limitation on the envelope in claim 1 is that it be plastic. It is

not specified to have both an inner and an outer wall, and thus, as Mr. Thomas admitted on cross-examination, claim 1 is broader in scope on its face than claims 2 and 3. However, Mr. Thomas was of the opinion that claim 1 was limited to a double-walled envelope because the attorney prosecuting the patent had described it as "quite similar in scope to allowed claim [2]", and because of certain language in the description section of the patent which he claimed indicated that only wrap-around envelopes with both an inner and an outer wall are contemplated by the patent. Analysis of the language of the patent will continue hereafter, however, we must briefly address the allegedly limiting description by State's patent attorney that claim 1 is similar in scope to claim 2, and the proposition that the limitations of claims 2 and 3 can be read into claim 1.

It is first noted that "similar" in scope does not mean "identical" in scope. The absence of the double-wall limitation on the term "envelope" in claim 1 is obvious. Claim 1 is similar in scope to claims 2 and 3 in that it is basically the same process described in 2 and 3, but it is broader, or less specific, so as to allow minor variation. The statement made by State's patent attorney cannot form the basis for imposing a double-wall limitation on claim 1.

As to the proposition that limitations from narrow claims may be read into broader claims, the Court notes that such was soundly rejected by the Federal Circuit Court of Appeals in Kalman v. Kimberly-Clark Corp., 713 F.2d 760 (Fed. Cir. 1983). In Kalman, the Court stated that "it is settled and proper law that 'Where some claims are broad and others narrow, the

narrow claim limitations cannot be read into the broad whether to avoid invalidity or to escape infringement.'" *Id.* at 770 (quoting Deere & Co. v. International Harvester Co., 658 F.2d 1137, 1141 (7th Cir. 1981). Mr. Thomas stated that he disagreed with this statement of the law and asserted that the "Bremerton" case would support his position. Builder's Concrete Inc. v. Bremerton Concrete Products Co., 757 F.2d 255 (Fed. Cir. 1985) contains no such contrary position on the doctrine of claim differentiation. As a matter of fact, the rule announced in Kalman was cited and followed in a later case by the same court. Yarway Corp. v. Eur-Control USA, Inc., 775 F.2d 268 (Fed. Cir. 1985). The Court finds this misstatement or misunderstanding of the law by defendants' expert to seriously undermine his credibility.

The Court finds that the plastic sleeve used by defendants is covered by the term "envelope" as used in the patent. In fact, the sleeve and the figure 5 embodiment (partial envelope) are identical structures which are simply secured differently at the bottom of the tank. The sleeve used by defendants is pulled over the tank and taped at the bottom over the fiberglass. The partial envelope of figure 5, also a cylindrical "sleeve", is pulled over the tank all the way to the bottom, where it is taped to the tank, or secured "by any suitable means such as a retainer strap member." Patent, Column 4, Line 12. The plastic cylinder is then turned back up on itself and brought back to the top of the tank. After the jacket is put on, the plastic is lipped over the jacket and captured between the outer jacket and the cover when it is placed on top of the jacket. When the foam is injected it is caught in the

upturned plastic, and as it rises, is contained by the tank wall on the inside and the plastic in the outside. The defendants' plastic cylinder is simply not turned under at the bottom to catch the foam. Defendants rely upon the tape and the small section of fiberglass within the tape to retain the foam at the bottom, and contend that this distinction is sufficient to take their method out of the scope of claim 1.

Defendants contend that their sleeve is not an envelope within the meaning of the patent because every description in the patent of an envelope includes a "bottom wall" to catch the foam. But defendants overlook the fact that when their sleeve is taped over the fiberglass and cinched to the tank, they also have formed a bottom wall within their sleeve. Defendants emphasize that it is the exposed fiberglass, and not the plastic and tape, which retains the foam at the bottom. But were the sleeve not taped over the fiberglass, the foam would not be retained at the tank base, for although the fiberglass helps prevent any leakage from the bottom of the sleeve, it is the taped off sleeve which retains the foam.

As discussed above, both plastic cylinders, the figure 5 embodiment and the defendants' sleeve, envelop the tank. Whether the cylinder is turned under at the bottom or taped over a small portion of the fiberglass seems of no consequence. The claim does not speak to the manner in which the envelope is secured at the base of the tank. Even if it was a cognizable departure from the claim it would only be a distinction that did not make a difference under the doctrine of equivalents.

Application of the doctrine of equivalents is appropriate when the allegedly infringing process "'performs substantially the same function in substantially the same way to obtain the same result.'" Graver Tank Co. v. Linde Air Products Co., 339 U.S. 605, 608 (1950) (quoting Sanitary Refrigerator Co. v. Winters, 280 U.S. 30, 42 (1929). In other words, the doctrine of equivalents will apply "when the alleged infringer seeks to appropriate the invention with minor modification to avoid the literal language of the claims." Carmen Industries Ind. v. Wahl, 724 F.2d 932, 942 (1983). Such would seem to be the case in regard to the distinction in the manner of securing the plastic at the base of the tank.

Defendants correctly assert that the doctrine of equivalents may be limited by the prior art. Carmen Industries v. Wahl, 724 F.2d 932 (Fed. Cir. 1983). But they incorrectly assert that the prior art of the HUD process would preclude coverage of their "sleeve" within the scope of the term "envelope." Defendants argue that the jacket in the HUD process is an "envelope" since it also envelops the tank; that the sleeve is identical to the jacket except that it is flexible (both are tubes pulled over the tank); and that the sleeve is therefore covered by prior art over which the doctrine of equivalents cannot extend. In a sense, the jacket is an inflexible envelope, but the differentiation between the HUD method and the patented method is that there is both an envelope and a jacket in the patented method. Likewise, in the defendants' method there is both the inner enveloping "sleeve" and the outer enveloping jacket. In addition, the jacket in the HUD process does not contain the foam around the tank and

within the jacket as do the plastic envelopes of plaintiff and defendants because the jacket is nowhere adhered to the tank. Thus, the defendants' "sleeve" is not excluded from the scope of the term "envelope" by reference to the prior art.

Having determined that defendants' sleeve is an "envelope" we must next turn to the issue of whether the defendants "wrap" their envelope around the tank within the meaning of the claim. Webster defines "wrap" as "to cover, envelop or enclose." *See*, Webster's Third New International Dictionary, p. 2638, (G. & C. Merriam Co. 1961). Thus, if the tank is enveloped by the envelope or sleeve there would seem little question but that the envelope or sleeve is wrapped around the tank. Since both of the pull-over structures, defendants' sleeve and the figure 5 embodiment, envelop the tank, both can be said to wrap the tank. In addition, a diagram from American's files of a cylindrical envelope which would have to be pulled over the tank contains the description "closed bottom plastic bag wrapped around the tank." Exhibit 27.

If the claim was rephrased to read: (1) Wrapping the exterior side wall of the tank with a plastic envelope," our discussion could end here. However, the claim also contains the term "around" -- wrapping a plastic envelope around the exterior side wall of the tank. In common usage the term "wrapping around" would appear more directed towards the process by which State's double-wall envelope with each end sealed, (shown in figures 2 and 3 in the patent and the embodiment actually used by State) is positioned on the tank rather than the process by which the cylindrical

envelopes are positioned on the tank. This is in keeping with the first definition of "around" listed by Webster: "in a circle or in circumference." *See,* Webster's Third New International Dictionary, p. 120, *supra*. The cylindrical envelopes are more specifically described as being pulled over the tank. However, the cylindrical envelopes could also be described as being positioned around the tank. The second definition listed by Webster for "around" is: "enclose from all sides so as to surround, confine or envelop." *Id.* Certainly when the cylindrical envelopes are attached to the base of the tank, and thus surround, confine or envelop the tank, they can be said to be around the tank. Thus, from a purely definitional point of view, the process by which the cylindrical envelopes are positioned on the tank comes within the meaning of the term "wrapping around."

More importantly, the patent itself displays two embodiments, figures 4 and 5, in which cylindrical envelopes are used which must be pulled over the top of the tank. Since such a procedure comes within the dictionary definition of the phrase "wrapping a plastic envelop around the exterior side wall of the tank," we must assume that it was intended to come within the patent's definition of this phrase. In describing the figure 4 embodiment the patent states that "the envelope 56 used therein is of a somewhat different shape than the previously described wrap-around envelopes 18 and 46." Apparently the inventor knew the difference between wrap-around and pull-over envelopes yet realized that step 1 of claim 1 would cover both. Step 1 does not say, "positioning a wrap-around envelope on the exterior side wall of the tank," it says, "wrapping a

plastic envelope around . . . ." The process is not limited to wrap-around envelopes, and the diagrams and descriptions reveal this. Therefore, the Court finds that the defendants' process is covered by the language and meaning of step 1 in the claim.

Having determined that defendants' process is covered by step 1 in the claim, the Court finds that defendants literally infringe claim 1 of the patent in suit by their process of insulating gas water heaters with foam using a plastic "sleeve" for foam containment as practiced at the facilities in Johnson City, Tennessee, and Santa Monica, California.

In addition, the Court finds that even if the defendants' process were determined to be outside the literal coverage of claim 1, the process must be deemed as an infringement under the doctrine of equivalents which was mentioned earlier. Here again, the dispute would center around step 1 because there is no question that once the plastic is on the tank, State, Mor-Flo and American each follow the same subsequent steps. The question then would be whether pulling a plastic sleeve over the tank and cinching it around the bottom over a small portion of fiberglass is the equivalent of wrapping a plastic envelope around the tank. It is the opinion of this Court that this question must be answered in the affirmative.

Defendants' expert, Mr. Thomas, testified that the patented claim could not be extended to cover the American/Mor-Flo process because of the prior art. Mr. Thomas testified that on one hand you have the HUD method using foam with no envelope, and on the

other hand you have the Japanese patent, previously referred to, which apparently discloses a sleeve structure in its figure 3; and, that therefore, the patent, if valid at all, would be limited to what is disclosed in figures 1, 2, and 3 of the patent in suit, which is a double-walled envelope that is wrapped laterally around the tank.

There is no question but that the patent in suit cannot be expanded to include foaming within the jacket with no envelope, but that is not what the defendants are doing. As to the Japanese patent, it is the opinion of the Court that this foreign patent does not so limit the application of the doctrine of equivalents in this case as to preclude coverage of defendants' process. The "sleeve" structure in figure 3 of the Japanese patent actually appears to be two separate sheets of plastic, one lining each side of the outer vessel. On the other hand, it may well be a cylindrical structure, but nowhere in the patent is it sealed off or cinched to the inner vessel or tank. Either way, there is no envelopment of the inner vessel as in defendants' process. In addition, there is no description of how the structure is assembled, and this would appear to severely limit its applicability to the patent in suit which only involves a method. Finally, as plaintiff points out, this Japanese patent is only a "paper patent" so far as we know, and thus is entitled to less deference than one that has been successfully practiced. Bela Seating Co. v. Poloron Products, Inc., 297 F. Supp. 489 (N. Dist. Ill. 1968).

The Court finds these considerations to severely limit the authority of Mr. Thomas' testimony on this issue. On the other side, Mr. Leudeka, plaintiff's ex-

pert, testified that defendants' process would infringe claim 1 of plaintiff's patent by application of the doctrine of equivalents, and the Court so holds.

Quite apart from the expert testimony and reasoning set forth above on the issue of infringement, the Court finds the testimony regarding the purchase and disassembly of a State foam-insulated water heater by both Mor-Flo in Johnson City and American in California, prior to their apparent conception and initiation of production using the "sleeve" method, to be particularly damaging. After observation of State's envelope, the defendants came up with a strikingly similar foam-containing configuration, and solved a problem which Walter Abt had made a top engineering priority in the summer of 1979. The inference drawn from these facts is that the defendants had a problem successfully developing a foam insulated heater; they sought help in this area by finding out how State did it; and, they then came up with their own variation of State's idea. These facts reinforce the Court's finding of infringement.

As has been discussed previously, it is the opinion of this Court that the defendants' process literally infringes claim 1 of the patent, but even if it could not be found to literally infringe, the minor variations utilized by the defendants are not sufficient to remove their process from coverage by plaintiff's patent under the doctrine of equivalents. "Outright and forthright duplication is a dull and very rare type of infringement. To prohibit no other would place the inventor at the mercy of verbalism and would be subordinating substance to form." Graver Tank, *supra*, at 607.

In conclusion, the Court finds the patent to be valid and the defendants' process to infringe the patented method of claim 1. Plaintiff is entitled to recover on its claim of infringement. Judgment shall enter for plaintiff on its claim and on the defendants' counterclaim of patent invalidity. The parties are instructed to brief the Court on the issue of damages and other relief sought within twenty (20) days from the date of entry of this Memorandum.

A hearing will be scheduled on this issue in due course if necessary.

ENTER:

/s/
THOMAS G. HULL
UNITED STATES DISTRICT JUDGE

Act of Feb. 18, 1922, ch. 58, § 8, 42 Stat. 392 as amended.

SEC. 8. That section 4921 of the Revised Statutes be, and the same is hereby, amended to read as follows:

"SEC. 4921. The several courts vested with jurisdiction of cases arising under the patent laws shall have power to grant injunctions according to the course and principles of courts of equity, to prevent the violation of any right secured by patent, on such terms as the court may deem reasonable; and upon a decree being rendered in any such case for an infringement to complainant shall be entitled to recover, in addition to the profits to be accounted for by the defendant, the damages the complainant has sustained thereby, and the court shall assess the same or cause the same to be assessed under its direction. If on the proofs it shall appear that the complainant has suffered damage from the infringement or that the defendant has realized profits therefrom to which the complainant is justly entitled, but that such damages or profits are not susceptible of calculation and determination with reasonable certainty, the court may, on evidence tending to establish the same, in its discretion, receive opinion or expert testimony, which is hereby declared to be competent and admissible, subject to the general rules of evidence applicable to this character of testimony; and upon such evidence and all other evidence in the record the court may adjudge and decree the payment by the defendant to the complainant of a reasonable sum as profits or general damages for the infringement: Provided, That this provision shall not affect pending litigation. And the court shall have the same power to increase such damages, in its discretion, as is given to increase the damages found by verdicts in actions in the nature of actions of treapass upon the case; but in any suit or action brought for the infringement of any patent there shall be no recovery of profits

or damages for any infringement committed more than six years before the filing of the bill of complaint or the issuing of the writ in such suit or action, and this provision shall apply to existing causes of action. And it shall be the duty of the clerks of such courts within one month after the filing of any action, suit, or proceeding arising under the patent laws to give notice thereof in writing to the Commissioner of Patents, setting forth in order so far as known the names and addresses of the litigants, names of the inventors, and the designating number or numbers of the patent or patents upon which the action, suit, or proceeding has been brought, and in the event any other patent or patents be subsequently included in the action, suit, or proceeding by amendment, answer, cross bill, or other pleading, the clerk shall give like notice thereof to the Commissioner of Patents, and within one month after the decision is rendered or a decree issued the clerk of the court shall give notice thereof to the Commissioner of Patents, and it shall be the duty of the Commissioner of Patents on receipt of such notice forthwith to indorse the same upon the file wrapper of the said patent or patents and to incorporate the same as a part of the contents of said file or file wrapper; and for each notice required to be furnished to the Commissioner of Patent in compliance herewith a fee of 50 cents shall be taxed by the clerk as costs of suit."

Act of Aug. 1, 1946, ch. 726, 60 Stat. 778 as amended.

That section 4921 of the Revised Statutes of the United States (35 U.S.C.A. 70) is hereby amended to read as follows:

"The several courts vested with jurisdiction of cases arising under the patent laws shall have power to grant injunctions according to the course and principles of courts of equity, to prevent the violation of any right secured by patent, on such terms as the court may deem reasonable; and upon a judgment being rendered in any case for an infringement the complainant shall be entitled to recover general damages which shall be due compensation for making, using, or selling the invention, not less than a reasonable royalty therefor, together with such costs, and interest, as may be fixed by the court. The court may in its discretion award reasonable attorney's fees to the prevailing party upon the entry of judgment on any patent case.

"The court is authorized to receive expert or opinion evidence upon which to determine in conjunction with any other evidence in the record, due compensation for making, using, or selling the invention, and such expert or opinion evidence is declared to be competent and admissible subject to the general rules of evidence applicable thereto.

"The court shall assess said damages, or cause the same to be assessed, under its direction and shall have the same power to increase the assessed damages, in its discretion, as is given to increase the damages found by verdicts in actions in the nature of actions of tespass upon the case; but recovery shall not be had for any infringement committed more than six years prior to the filing of the complaint in the action. And it shall be the

duty of the clerks of such courts within one month after the filing of any action, suit, or proceeding arising under the patent laws to give notice thereof in writing to the Commissioner of Patents, setting forth in order so far as known the names and addresses of the litigants, names of the inventors, and the designating number or numbers of the patent or patents upon which the action, suit, or proceeding has been brought, and in the event any other patent or patents be subsequently included in the action, suit, or proceeding by amendment, answer, cross bill, or other pleading, the clerk shall give like notice thereof to the Commissioner of Patents, and within one month after the decision is rendered or a judgment issued the clerk of the court shall give notice thereof to the Commissioner of Patents, and it shall be the duty of the Commissioner of Patents on receipt of such notice forthwith to endorse the same upon the file wrapper of the said patent or patents, and to incorporate the same as a part of the contents of said file or file wrapper."

This Act shall take effect upon approval and shall apply to pending causes of action in which the taking of the testimony has not been concluded: Provided, however, That pending causes of action in which the taking of the testimony has been concluded are to be governed by the statute in force at the time of approval of this Act as if such statute had not been amended.

SELECTED
TRIAL TRANSCRIPT
PAGES

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TENNESSEE
NORTHEASTERN DIVISION

STATE INDUSTRIES, INC.,

PLAINTIFF,

VS. NO. CIV-2-84-276

MOR-FLO INDUSTRIES, INC.

DEFENDANT.

STATE INDUSTRIES, INC.,
ASHLAND CITY, TN

PLAINTIFF,

VS. NO. CIV-2-85-86

AMERICAN APPLIANCE MFG. CORP.,

DEFENDANT.

TRANSCRIPT OF PROCEEDINGS

HONORABLE THOMAS G. HULL
MAY 2, 1988

For electric and gas water heaters during that time and it was very well met by the foam water heaters.

Q And is it your understanding that all the water heaters that Mor-Flo sold that were made using the patented method were energy saving type water heaters?

A That's my understanding.

Q That's because they were foam insulated?

A Yes.

Q Have you authorized a patent infringement suits to be filed against other competitors under your foam patents?

A Yes.

Q And have such infringement suits been filed?

A Yes.

Q Against who have suits been filed today?

A Rheem Manufacturing and Hoyt Water Heaters Company.

Q Could you explain a little bit more -- let's take Rheem Manufacturing Company. How do they fit into the water heater industry?

A They are what we refer to as a

co-leader with state volume almost equal.

Q And how do you categorize the Hoyt Water Heaters Company?

A They are the smallest of the water heater competitors.

Q Have you been advised by your patent attorneys that other companies besides Rheem and Hoyt are infringing your foam patents?

A Yes.

Q Would you identify what companies have been referred to?

A G.S.W. of Canada and Bradford White of Michigan.

Q All right, let's take G.S.W. Has a suit against G.S.W. been authorized under your corresponding Canadian patent?

A Yes.

Q Has a suit actually been filed as of this date?

A No.

Q Let's take Bradford White, has a suit been filed against Bradford White as yet?

A No.

Q Is there some reason why you haven't brought suit against Bradford White?

You explain what you meant by jacket?

A Well, one way that the manufacturers or one way the plumbing contractors get around a foam filled heater, they will take a regular heater and put a fiberglas jacket around the outside of the heater and tape it in place to give it added insulation. In California under the new energy requirements they even put it around the foam filled heaters.

Q So you were able to meet the same requirements without this jacket, is that your point?

A Yes, that's correct.

Q Now, when did you -- I think you stated you started selling State water heaters back in what, 1979, 1980?

A Yes.

Q Now, what impact on your marketing activity did the advent of the Mor-Flo foam heater have on your sales?

A Well, it hurt our sales in that we now had added competition. Before -- well, Mor-Flo and Hoyt Water Heaters were the two big water heater manufacturers in Northern California. Without Mor-Flo and Hoyt, we had opportunities to sell our foam filled heaters. With the advent of Mor-Flo, those opportunities were lost.

Q In the years 1984-86, did your company

actually lose sales of foam insulated water -- resident water heaters to Mor-Flo?

A Yes.

Q Is there any doubt in your mind that some sales were lost during that period because of Mor-Flo's presence on the market?

A No doubt at all.

Q If you could, explain in a little more detail how these sales were lost?

A Well, in the new housing market, in one particular case, a plumbing contractor by the name of Los Madono's plumbing did all of the plumbing work for a large developer in California, three thousand homes a year, came to us and asked us for prices on water heaters. And we knew from the past that it was a very competitive market and we gave the best prices we possibly could to our plumbing contractor and Mor-Flo took those orders. When I am saying the best price we could, we offered them to them at our cost.

Q I believe in your deposition, you mentioned that you had difficulty competing with Mor-Flo with the larger contractors, the larger home builders, is that --

A That would be one of the examples, yes.

Q Would there be other examples of such a

ADMISSION BY STATE'S ATTORNEY, MR. PUERNER, THAT THE RHEEM FOAM GAS HEATER DID NOT INFRINGE THE PATENT IN SUIT

units, that Rheem had infringed both the process patent and product patent?

A If that's what my lawyer tells me, I have to take his word for it.

Q My question is, is that what they told you?

A Let's look up what the Rheem patent suit is all about. It involves both patents. As I just read it from the document.

Q Well, maybe I can help by reading to you, we asked your company in an interrogatory whether your company was contending that Rheem was infringing the process patent?

Mr. Puerner: Excuse me, maybe we can save some time. We are not taking the position that the Rheem gas foam heater infringes the method patent.

Q Okay. So as of 1984 with Rheem, they weren't infringing the method patent and they weren't infringing the product patents either, were they?

A Again, I cannot answer you that question, I would have to refer that question to our attorney.

Q Well, actually it's very simple --

A Maybe to you.

Selected pages from deposition of State's Chairman of the Board and CEO.

Defendants' Ex. 316

Q You say not necessarily, which is a qualified answer. Are there instances where there are?

A There possibly are instances where they are, but it's not a part of the requirements -- it's not a necessary or normal part of our transaction with Sears that they involve us with their pricing at all.

Q Now, State sells to the plumbing industry, does it not?

A As well as the retail industry.

Q Now, in considering the retail industry, are the State prices for gas-fired foam insulated water heaters higher or lower than those charged by A.O. Smith -- or for A.O. Smith gas-fired fiberglass insulated water heaters?

THE WITNESS: Would you repeat that one for me, please, ma'am?

(Whereupon, the reporter read the previous question).

THE WITNESS: I wouldn't have any way of knowing.

Q (By Mr. Hofeldt) Do you have any evidence of which you are aware that State Industries has been unable to sell its foam insulated gas-fired residential water heaters because of Mor-Flo's sales of foam insulated gas-fired water heaters?

A You mean have we lost an order?

Q Yes.

A No, we have not lost an order.

Q Have you reduced prices because of Mor-Flo's sales of foam insulated gas-fired residential water heaters?

A Yes, sir, we have.

Q When did that occur?

A This happens regularly.

Q Were heaters manufactured by Rheem a cause for a reduction in prices by State for its foam insulated gas-fired residential water heaters?

A They have been, yes.

Q To the same degree as with regard to Mor-Flo?

A I would say no, not to the same degree.

Q Which is the lesser degree?

A We find a competitive situation that we must meet with Mor-Flo more often than we do with Rheem.

Q And is that regional?

A Yes.

Q In what region has the competition occurred?

A Well, it has occurred in all regions.

Q Has the Mor-Flo sales of foam insulated gas-fired water heaters in the last year resulted in lower prices for the State gas-fired foam insulated water heaters?

PATENTS/Edmund L. Andrews

Courts Called Tougher On Infringement

The case of Procter & Gamble's $125 million chewy cookie is now closed. But patent attorneys believe it offers dramatic evidence of the growing importance that Federal courts attach to patent rights.

On Tuesday, P.&G. announced that three companies -- the Keebler Company, RJR Nabisco and Pepsico's Frito Lay subsidiary -- had agreed to pay $125 million for violating its patented recipe on cookies that are chewy on the inside and have a crispy crust. The companies agreed that Procter's patented recipe was valid, and have stopped using that formulation.

The settlement comes five years after P.&G. filed a suit charging infringement and just weeks before a trial was to begin. Although the rationale for the size of the settlement has not been disclosed, attorneys note that Federal courts have become far more willing to declare patents infringed and much tougher about assigning damage awards.

Court Created in '82

The biggest reason for these changes, legal experts say, was the creation in 1982 of the Court of Appeal for the Federal Circuit in Washington, which specializes in patent and trademark law. Before its creation, such cases worked their way up through district and regional appeals courts. Now, they proceed directly from district court to the Federal

Circuit, which has ironed out contradictory precedents and taken bolder interpretations of many patent rights.

"You would never have seen these types of settlements before the Federal Circuit was created," said Michael A. Epstein, a New York attorney with Weil, Gotshal & Manges.

In particular, the courts have expanded the concept of "lost profits," said David J. Lee, an attorney with Fish & Neave. In suing for lost profits, a company asks for the profits from all sales it would have incurred if the patent had not been infringed. But in addition to profits lost at current market price, the concept includes hypothetical profits that a patent holder might have earned if the holder had enjoyed the higher prices of a monopoly position.

"In the old days, courts were receptive to the argument that a wide variety of products were competing alternatives to the patented product," Mr. Lee said. For example, Keebler might have argued that Entenmann's cookies could have taken up the slack if it had not entered the market.

In recent decisions, Mr. Lee said, the Federal Circuit Court has held that it will only consider alternatives that contain almost all the same benefits as the patented product. Thus, chewy cookies that are soft on both the inside and the outside would not be assumed to detract from a monopoly position.

Finally, the court recently came up with a market allocation formula to deal with cases in which alternative products do take up some of the market. Even if alternatives provide some competition, the formula makes it possible to argue for lost profits based on partial domination of the market.

Most patent experts agree that the chewy cookie settlement will not be the biggest for long. Polaroid's suit against the Eastman Kodak Company, now in progress, claims more than $5 billion in damages, and the Hughes Aircraft Company is in the last stages of a $3 billion patent suit against the Federal Government concerning satellite control systems.